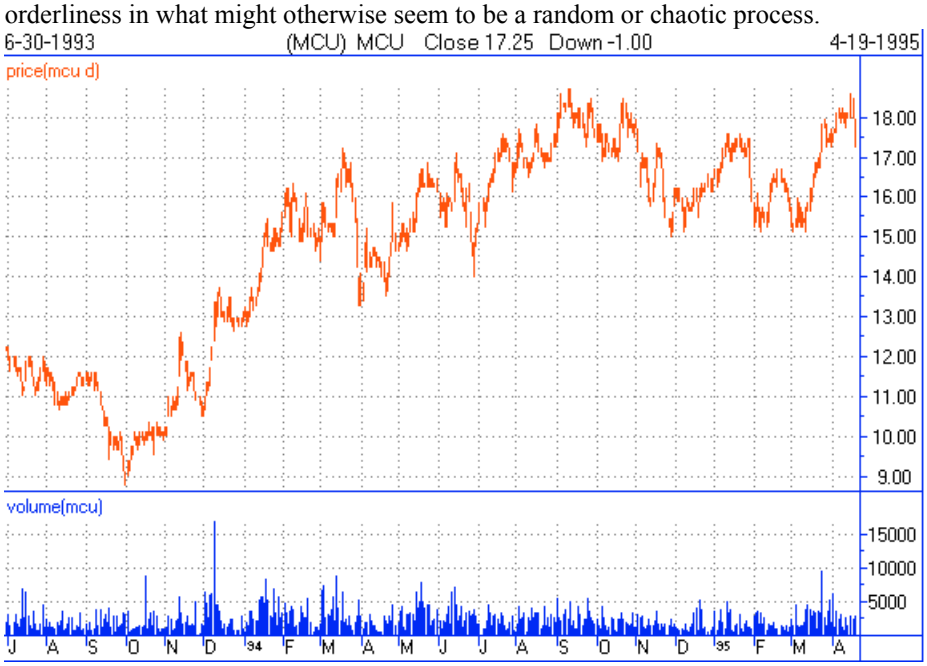
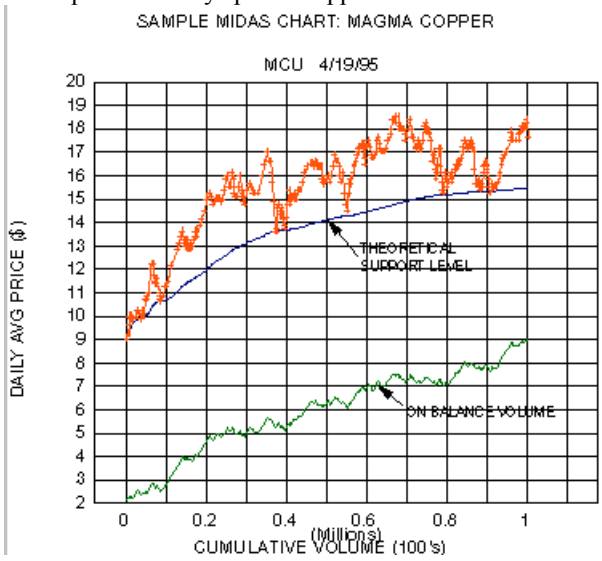
Introducing the MIDAS Method of Technical Analysis
by Paul Levine

In this, the first of a series of columns, we will introduce to the community of technical analysts a new approach to charting the price history of a stock or commodity. I call this technique the MIDAS method, an acronym for Market Interpretation/Data Analysis System. It is designed to focus attention on the dynamic interplay of support/resistance and accumulation/distribution which are the ultimate determinants of price behavior. Indeed, a Midas chart makes immediately visually apparent an unexpected degree of orderliness in what might otherwise seem to be a random or chaotic process.



Take a look at the first of the figures. Here we have a standard price and volume bar chart for Magma Copper as of the April 19, 1995 close. I do not believe any of the familiar charting methods would contribute anything of value to the interpretation of this chart. There are no clearly evident trend channels, trendlines, support or resistance lines, etc. Indeed, after the initial runup from 9 to 17, the subsequent sideways pattern appears to be random and trendless.



Now look at the Midas chart for the same stock. First observe that to simplify things we only plot the daily average price (i.e. the average of the high and low). More signifcantly, we plot the prices vs. CUMULATIVE VOLUME rather than time. This has the effect of giving less visual weight to periods of relative inactivity (e.g. Feb 1995) since the lower cumulative volume increase during such a period compresses the daily points into a smaller space. (We will see later on why it is important to deemphasize periods when there is little alteration of the ownership profile of the people holding the stock).

Next, observe the curve marked "theoretical support level", and in particular how this corresponds precisely to the trend reversal points. You might think that in some sense the theoretical support curve has been "fitted" to these reversal points, much in the same way that trendlines are fitted to bar or point and figure charts. Remarkably, this is not the case; the theoretical support curve is determined a priori, has no adjustable parameters and follows from a very simple equation. In a later column I will derive this equation from a quantitative consideration of a few universal features in the psychology of the trader. For now just take my word for the fact that the theoretical support curve was constructed in a universal fashion from the raw price and volume data.

From the standpoint of practical trading, the important thing is that the price trend reversals (eight in all) all occurred precisely where they were expected to. This by itself both confirms a primary bull trend, and provides low risk entry points for long positions. One

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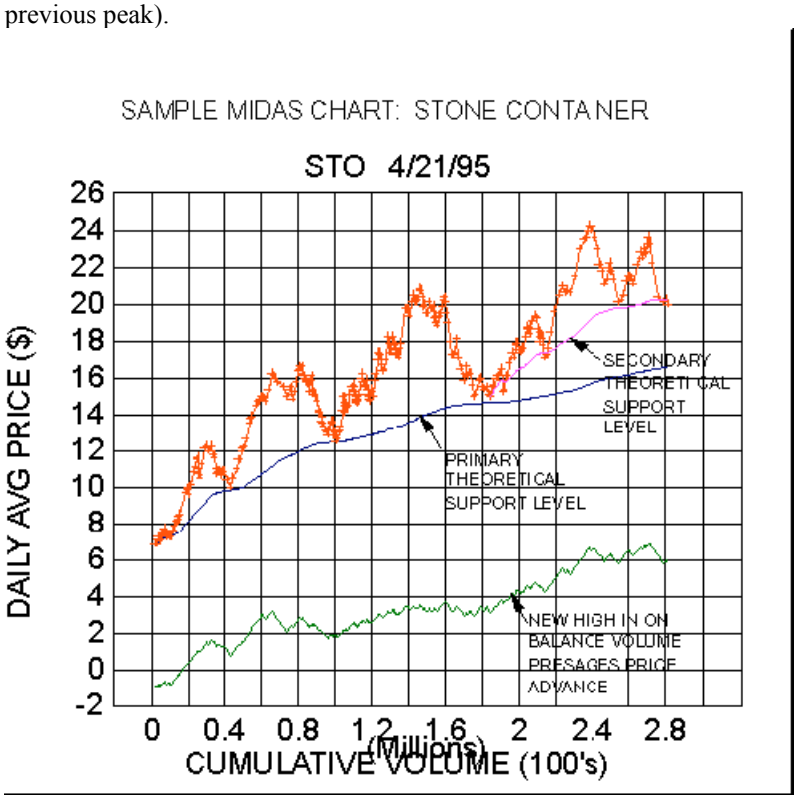
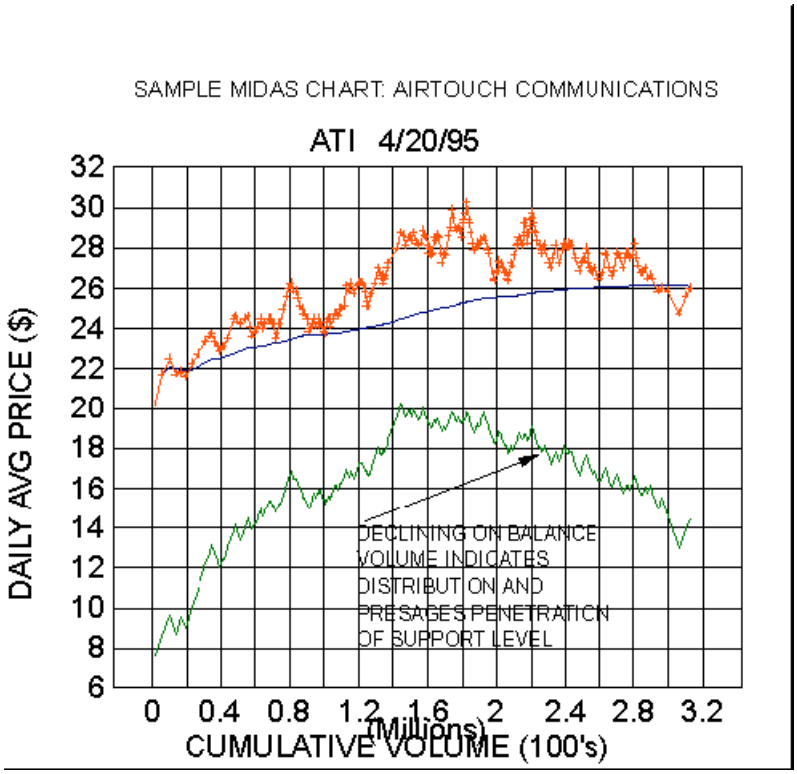
simply waits for the price to approach the support curve and jumps on board at the first indication of a "bounce". (Where to sell is of course another matter which we will treat at length in future columns).
But how strong a bounce are we to expect, or to put it another way, how strong is the underlying bull trend? To assess this, we add one final feature to the Midas chart, viz. a minor variant of Joe Granville's on- balance volume ("obv"). This curve is constructed by adding today's volume to the (accumulated) on-balance volume if today's average price exceeds yesterday's average price, subtracting it if it is less, and not changing the on-balance volume if there has been no day to day change in average price. (The absolute scale of the obv curve is immaterial and is simply adjusted to fit on the same chart as the price). The value of obv is that it makes immediately clear whether a stock is undergoing accumulation or distribution.
In the present example we see that obv is in a definite upward trend (accumulation) and that the obv trend continues even during periods of sideways price action. This is ideal bullish confirmation of the price trend. To summarize the ground we've covered in this first brief introduction, we have shown how price and volume data for a specific stock can be displayed in a new fashion which makes immediately apparent an underlying trend that is all but hidden in a conventional chart of the same data. It is a totally remarkable circumstance that this general approach to charting appears to be of practical value in most markets for which I have been able to test it against price and volume data. In my next column I'll give a few more examples of Midas charts for stocks of current interest. When we have examined together several such examples and have thereby developed a familiarity with this new way of looking at things, there should be sufficient motivation to delve more deeply into the mechanics of generating the theoretical support curve. In so doing, we will come to discover other unexpected regularities in what has often been dismissed as random walk processes. Stay tuned!
In the first article of this series we introduced the Midas chart as a new way of displaying historical price and volume data. Containing three essenial elements: daily (average) price, a theoretical support level, and on balance volume - all plotted vs. cumulative volume rather than time - the Midas chart provides a hitherto unavailable framework for categorizing and in many cases understanding the dynamics of price behavior.
Specifically, in this approach, it is the price relative to the theoretical support curve that determines the degree to which the stock or commodity is overbought or oversold. This is in contrast to the more familiar methods of technical analysis which focus instead on price relative to moving averages, linear trendlines and/or previous tops and bottoms. The on balance volume in turn provides a measure of the "strength" of the support curve, i.e. whether it will hold or be penetrated.
In this and future articles, we will develop these concepts by studying specific examples in detail. So let's turn first to the Midas chart for Stone Container below. Note first how well the theoretical "primary" support level curve predicted the actual trend reversal points. (Traditional technical analysis would have anticipated that the pullback from the peak at around 21 would be stopped at about 17 - the previous peak).



Next note how the movement of the on balance volume to new high ground correlates with the subsequent move to new highs in the price. This is in contrast to the second example below, Airtouch Communications, where the marked declining trend of obv correlates with the subsequent penetration of the theoretical support level. In the absence of the obv data, one might have expected the support level to "hold" and give rise to a new upward price leg since up to that point it had indeed provided support just as in Stone Container.

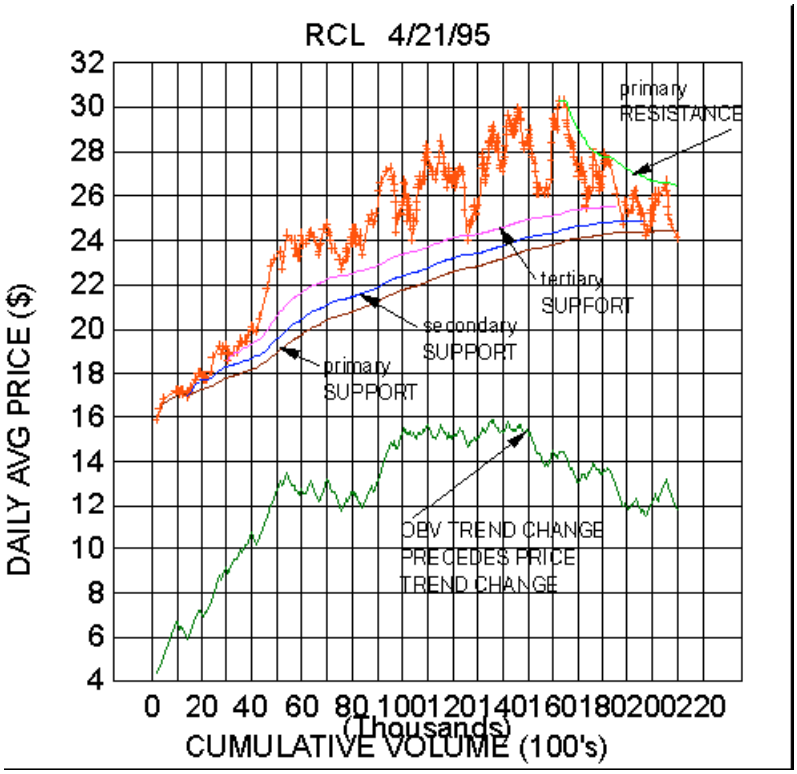


Returning to Stone Container, note finally that we have introduced a new feature of the Midas method: the concept of a hierarchy of support levels. We thus speak in terms of a "primary" support and a "secondary" support. (While we have yet to present the equations for these theoretical curves, for now we can say that both the primary and secondary support curves are generated by the same algorithm.) Indeed, in articles to follow we will show examples of strongly trending stocks for which one can clearly distinguish primary, secondary, tertiary and even fourth order support levels.

To introduce some Midasspeak, a Midas theorist would describe Stone Container thusly: "STO is in a primary bull move, with a thrice validated primary support level. It has currently pulled back to and is pausing at a doubly validated secondary support. No deterioration in the upward trend of obv is yet evident, so the expectation is that the secondary will hold and the price will resume its upward motion. If the secondary fails to hold, the price would be expected to decline at least to the primary support level at about 17."

Even though we have only looked at three Midas charts in this and the previous article, there should already be a change in the way we look at a conventional price vs time bar chart. One should focus on the trend reversal points and see whether one can visualize a series of support curves to which they might correspond. To facilitate this visualization, in the article to follow we will transform Midas charts from the cumulative volume to the time domain. In addition, since these three examples are all in contemporary real time, we will revisit them later to see how useful the Midas framework has been in characterizing their subsequent behavior.

In the previous article in this series, we introduced the concept of a hierarchy of support levels, according to which trend reversal points can be identified with finding support at one member of a group of theoretical support curves (labelled "primary", "secondary", "tertiary" etc. according to seniority). This is illustrated in the Midas chart for Royal Carribean Lines (RCL), where we have plotted three such support curves. We have also called attention in this chart to another example of the utility of including the obv as a leading or coincident indicator of price trend change.

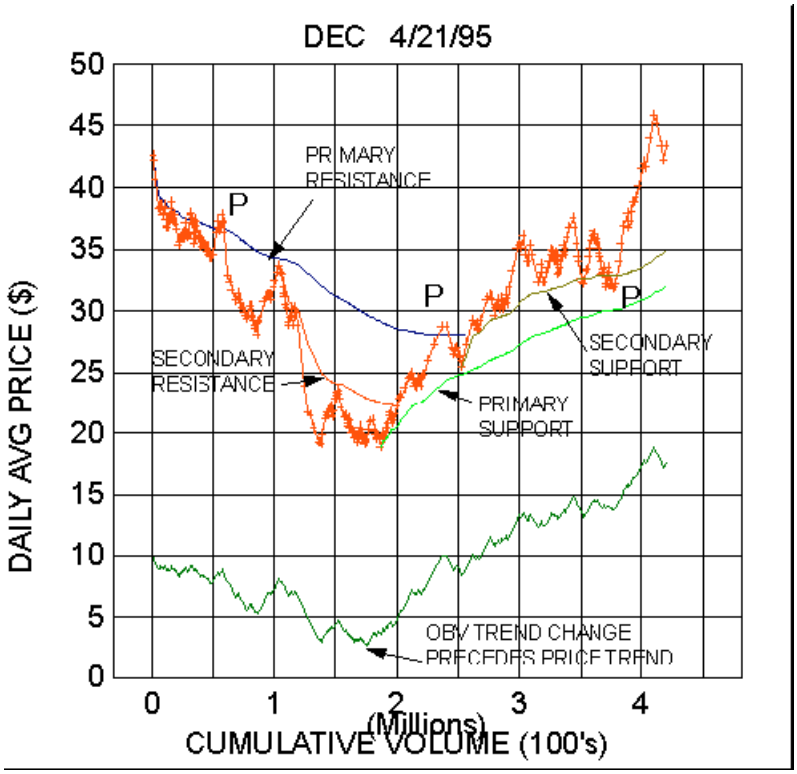


Note also that for the first time we have shown a theoretical RESISTANCE curve. In point of fact, there is complete symmetry in the Midas method between support and resistance! The theoretical resistance curve is generated by exactly the same algorithm as the support curve(s).

As a general rule, when one observes multiple confirmations of a relatively "young" resistance curve, together with a change in the trend of the obv - as in the RCL example - then the expectation is that the hierarchy of support levels will be violated one by one and replaced by a new hierarchy of resistance levels defining the new primary bear trend. This is on the verge of happening in RCL which is at a crossroads as of 4/21/95.

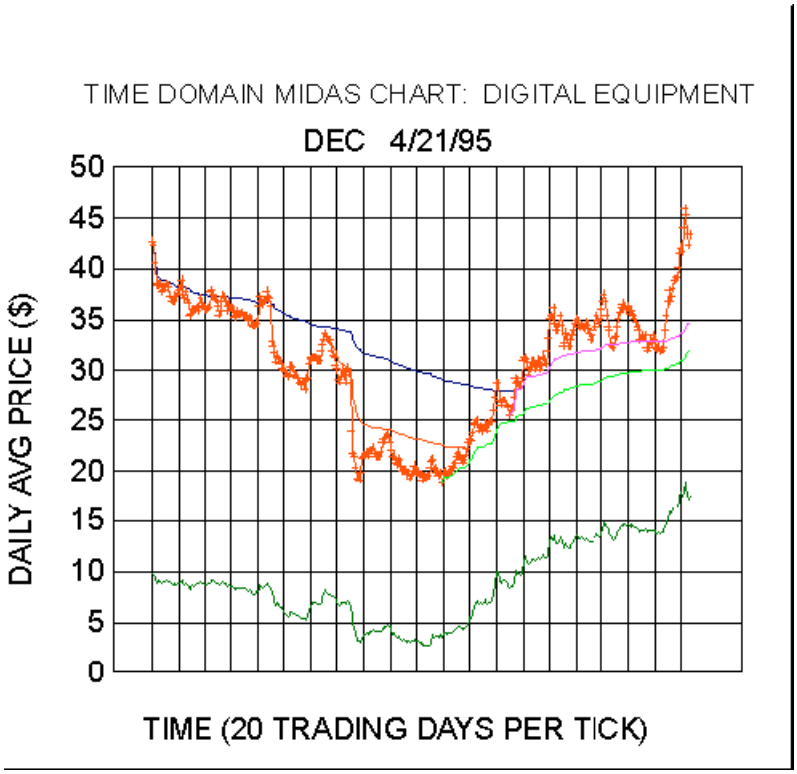
Note RCL has stopped at the primary support level and that obv has not yet broken down into a new low (in fact it is slightly higher than it was at the previous contact with the primary). RCL could bounce from here and again challenge the primary resistance. In fact we often encounter cases where the price is "squeezed" between primary support and resistance curves, a silent mortal combat that is usually not evident in the conventional charts. If the price does convincingly penetrate the primary support, on the other hand, with corresponding new low in the obv, then the probability is high that the primary bull move which carried RCL from 16 to 30 is over.

A second example of the completely symmetrical roles played by the theoretical support and resistance hierarchies in the dynamics of a major trend reversal is shown in the Midas chart for Digital Equipment (DEC). The near-coincident penetration of the primary resistance, the breakout into new high ground of the obv and the first validation of the young secondary support (at a cumulative volume of about 2.65) all confirmed the expectation that a primary bull trend was underway. Conventional technical analysis, on the other hand, might have interpreted this as merely a "normal" 50% retracement of the drop from 43 to 19!



Now note the areas marked "P" in the DEC chart. P stands for "porosity" which is the term I use to characterize situations when a "bounce" from a support or resistance level is not "clean" in the sense that some relatively small penetration occurs before the expected trend reversal. Perhaps "elasticity" would be a better term than porosity, since the S/R (an abbreviation for "support or resistance" which we shall henceforth use) level can be imagined to have some "give" rather than being rigid. Or one could just say that the Midas method is after all a simple approximation to a more complex and less deterministic reality.

Finally, to deliver on a promise made at the conclusion of the preceding article, in the next graph we show what the DEC Midas chart would look like if we plotted everything versus time rather than cumulative volume. In this mode of representation, the S/R levels are seen to be "jerky" and therefore are difficult to visually extrapolate, whereas in the cumulative volume domain they are relatively smooth and continuous. Thus we prefer to work with cumulative volume instead of time, although this is not always possible. When we wish, for example, to introduce the Midas theoretical S/R levels into commercial charting software packages - which we will in fact do in a later article - we are stuck in the time domain since such packages have no flexibility in choice of abscissa. Our hope of course that these articles will create sufficient interest in the Midas approach to motivate the software authors to generate Midas upgrades to such packages!

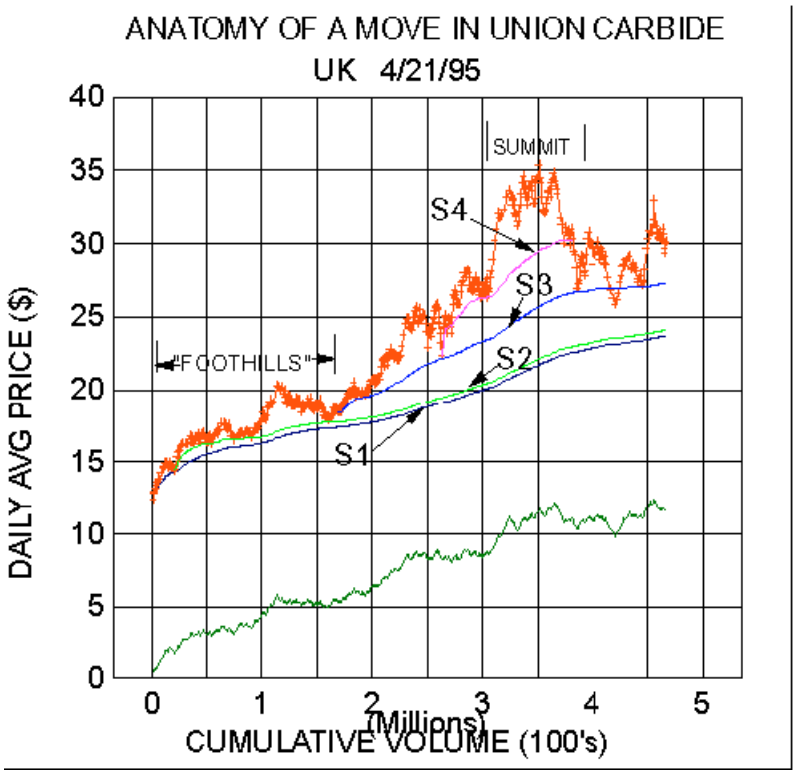


It is worthwhile to pause for a moment at this stage of the development to delineate what it is we are trying to accomplish with the Midas method of technical analysis. Our objective is best explained by analogy to the understanding of atomic spectra as it existed in the 19th century, before quantum mechanics. Spectral lines had been observed to group into families according to their wavelengths, and numerological relationships such as the Balmer series were empirically fitted to the observations. Some order was thereby imposed on the complex spectra, but without any understanding of the underlying reason why these formulae should apply. It wasn't until the spectral lines were identified with transitions between discrete atomic energy levels, that it became clear that an understanding of the spectra would follow directly from an understanding of these levels. The levels were the fundamental reality, and the spectra a secondary consequence.

In like fashion, we view the hierarchy of S/R levels as being the fundamental reality underlying stock price behavior, and do not believe that a coherent model of this behavior is possible without them. It is therefore not surprising that extant computerized trading systems which do not include this reality are generally ineffective. Even with the powerful tools of neural networks and adaptive systems, one is in effect finding the optimum square peg for a round hole.

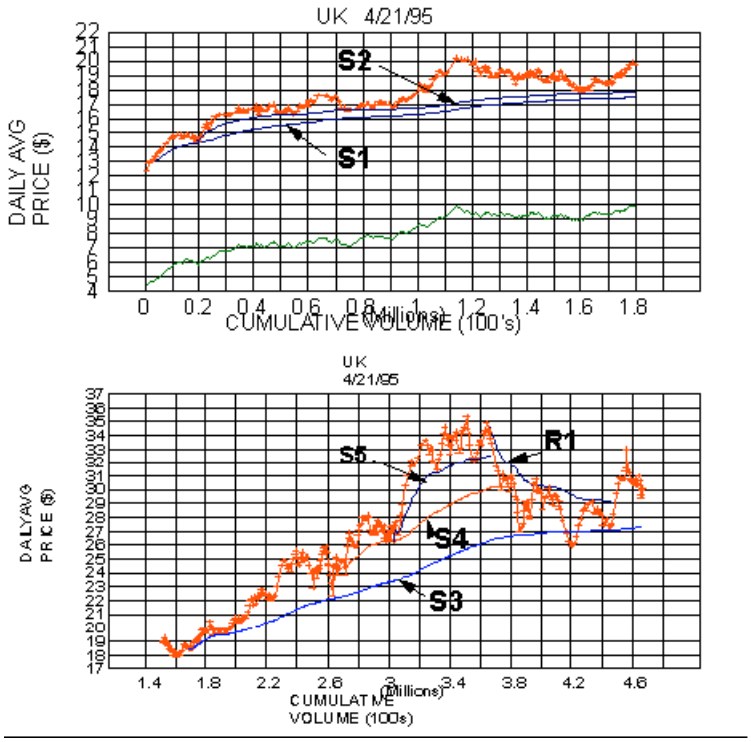
With our focus on the relationship between price and the S/R hierarchy, we have a powerful taxonomic tool to identify universal patterns of behavior exploitable for trading profit - patterns that would not be discernable from a consideration of the prices alone, i.e. without reference to the S/R hierarchy.

We can illustrate this by a detailed consideration of the anatomy of a complete bull move in a stock. The first figure shows the Midas chart for such a move in Union Carbide (UK). The chart covers 638 trading days ending on April 21, 1995, or about 2.5 years. Plotted on the chart are four support levels S1..S4 (a numbering shorthand we will henceforth use for simplicity).



We turn first to the start of the move and have identified what I call the "foothill" pattern. Anyone who has approached the Sierras in Calif. from the west has noticed that one first traverses a series of gently rolling hills whose rate of rise is quite gradual compared to those of the mountains ahead. Clearly if one can identify a stock move in the foothill stage, one can capture the bulk of the price appreciation.

In the top half of the second figure we therefore put a magnifying glass to the foothills, a period covering about 230 trading days. Note how beautifully the prices ride along the secondary support S2, and how the obv is poised to break out into new high ground. Referring back to the first figure we see this is just prior to the start of the sharply climbing price "mountain".



THIS FOOTHILL PATTERN HAS PROVEN TO BE THE MOST USEFUL TOOL FOR SPOTTING LOW RISK/HIGH REWARD ENTRY POINTS FOR INTERMEDIATE TERM LONG POSITIONS. It is noteworthy that

without reference to the support levels, very little seems to be going on in the foothills. For months at a time the price is confined to a very narrow range and it is only if one is trained to look for a pattern of repeated bounces from a theoretical support level that the situation can be recognized. Imprint this graph firmly in your mind, for we will see this behavior over and over again. Indeed, in future articles I will call attention to such occurrences in real time, as they are unfolding!

The lower half of the second graph focuses on the summit of the price mountain. What I wish to emphasize here is that in the final push to the summit, the applicable support level was of FIFTH ORDER. As a general rule, when one observes such high-order support levels holding up prices, the end is known to be near. One then pays particular attention to ancillary indications of topping behavior, such as the head and shoulders formation evident at the UK summit, to time one's selling. (We will present other tools for identifying selling points in future articles).

Note how the drop off from the summit is bounded by the resistance level R1 for several months until it in turn is penetrated by the recent bounce from S3. What does the future hold from this point on? Our best guide is the obv curve of the first graph, where we see that obv is still quite close to its high. This would tend to indicate that there is still some life in the bull move yet, and that another leg to new high prices may be in the offing, perhaps after one more pullback to and bounce from S3 at about 27 1/2. Indeed, the penetration of R1 makes this the likely scenario. We'll revisit UK in a future article to see how things work out.

In the previous article we emphasized that our primary goal with the MIDAS method is to provide a means of characterizing price behavior which is based on underlying realities rather than ad hoc empiricism or numerology. This is fundamentally a scientific question, quite apart from the tactical matter of utilizing such knowledge for trading advantage. In a broad sense we may thus distinguish between what might be called the scientific and the engineering aspects of MIDAS, where the former encompasses the quantitave "laws" which give rise to the S/R hierarchies, and the latter refers to practical trading rules and techniques based on this understanding.

We made a start on the engineering side by showing how the "foothills" could be recognized and used as a low risk/high reward entry point for intermediate term long positions. Here the window of opportunity is quite wide in time since the foothills have a typical time scale of the order of months and it is merely a matter of scrutinizing a sufficiently large number of stock charts to find some likely candidates. Once one gets used to spotting foothill behavior in the gentle undulations of conventional bar charts, a few hours each month leafing through a book of daily basis stock charts will suffice to identify at least 30 or 40 such candidates justifying further analysis using quantitative MIDAS methods.

The reversal of a long consolidation or bear leg within a primary bull move, via a bounce from S1 or S2 provides an even better trading opportunity since the gains come much more quickly and the price objectives are well defined. (At a minimum one expects to reach the nearest resistance level, usually an R1 or R2. If this is penetrated then the next objective is the previous high.) The window of opportunity is however much shorter, typically a few days to a few weeks. Furthermore, for any given stock there may only be one or two such opportunities per year.

Thus while MIDAS methods could be used on single stocks to determine good entry points for long positions suggested on fundamental (as opposed to technical) grounds, the trader will monitor many stocks (of the order of hundreds) in order that sufficient opportunities will be found to keep capital off the sidelines. To facilitate the application of MIDAS to a large universe of stocks in real time, we have developed some interesting techniques for compressing a fairly complete MIDAS characterization of a given stock into a few ascii characters.

This is illustrated in the first figure which contains a Midas chart of EMC Corp. By now this should be so familiar that no commentary is required. (Although one cannot refrain from marvelling at how well the trend reversals are anticipated!). Above the chart is a single line of ascii characters and its associated legend.

EXAMPLE OF MIDAS PROFILE: EMC CORP

```
 OBVR   DIST   SPRD STOCK PMIN   PMAX 1----------------------------------h
0.722 0.201 7.889 EMC    2.63 23.38 1--------------------Ss---s-*-------h
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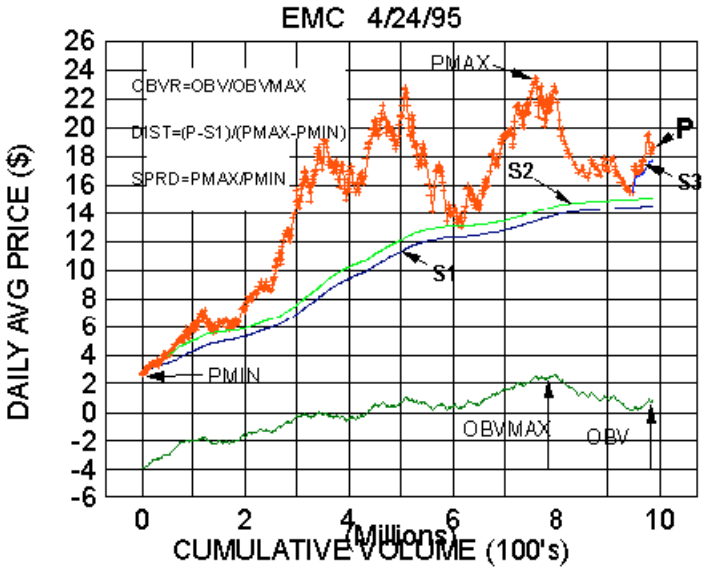


Note the line of dashes bounded by an "l" (for low) and an "h" (for high). This represents a price range extending from 2.63 to 23.38 in this case. The capital "S" denotes the relative position within this interval of the primary support level S1. The corresponding positions of the secondary and tertiary supports are indicated by lower case "s"'s. The asterisk is the average price for that particular day. Thus this so-called MIDAS Profile shows the number of S/R levels (resistance levels use "r" instead of "s"), their relationship to each other and to the latest price, as well as where they all stand in relation to the high and low for the historical period in question.

Two further features may be simply added to convey even more information. If a given S/R level is particularly well "validated" (i.e. it has successfully predicted several trend reversals with little porosity), we can underline the symbol as we have done for S2 (or it could be made boldface if the software and printer permit). In addition, if the asterisk should happen to coincide with an S or an s, we can replace it with a >> or a > (or << or <) respectively. This has the effect of immediately calling attention to the fact that the price is at an S/R level and perhaps ready to bounce.

In addition to this pseudo-graphical technique, we generate the three ratios defined in the graph. OBVR is an obv ratio measuring how far the obv has retreated from its peak value. The closer OBVR is to unity, the more bullish the outlook. DIST (standing for "distension") is a normalized measure of how close the latest price is to S1. SPRD (for "spread") measures the volatility of the stock over the historical period of study.

Trading rules can be developed based on these three quantities. For example, one can only enter long positions when OBVR exceeds a certain threshold, DIST is less than another threshold (i.e. close to S1 and ready to bounce) and SPRD is greater than a third threshold (to weed out stocks that are not volatile enough to have a sufficient potential reward). Now a neural network trained on these inputs might have some hope of success!

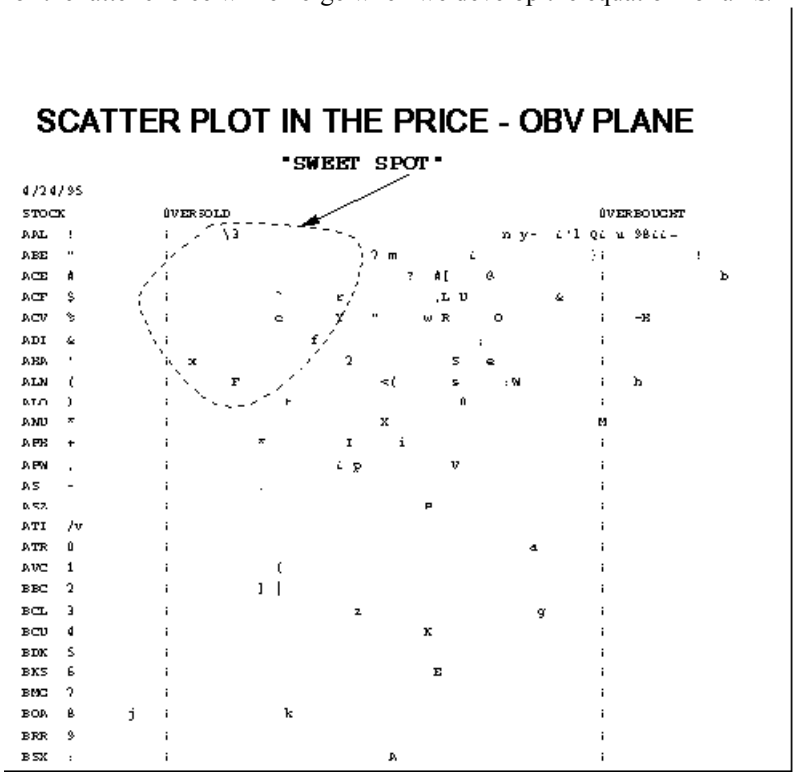
For a group of stocks, one would then generate each day a table such as that shown in the second figure. With a little practise one can thereby review a few hundred stocks in a matter of minutes to identify interesting opportunities.

TABLE OF MIDAS PROFILES FOR A UNIVERSE OF STOCKS

```
4/24/95
 OBVR   DIST   SPRD STOCK $MIN   $MAX 1----------------------------------h
0.987 0.610 0.733 AAL   14.13   24.5 1--------------S-s--------s--------*
0.953 0.243  1.71 ABE       3   8.13 1---------------------S---r---s*--h
0.978 0.315 2.129 ACE    6.63  20.75 1---------------------Sss---s-r--*-h
    1 0.573     3 ACF    2.25      9 1--------------S----------s--------*
    1 0.503 0.582 ACV   19.75  31.25 1-----------------S----ss-s---------*
0.969 0.454 3.130 ADI    6.75  27.88 1-----------------s---s----------*--h
    1 0.466  3.46 AHA       3  13.38 1-----------------S----s-s--------*-h
0.924 0.262 0.804 ALN   14.13   25.5 1------------------s-----s--*-s----h
0.982 0.351 0.826 ALO      13  23.75 1------------------Ss----s-----*--h
0.897 0.117 1.937 ANU       4  11.75 1------------------s-s-*-r-r-------h
    1 0.574 1.709 APH   10.75  29.13 1----------------S-----------------*
0.964 0.311 0.703 APW   15.63  26.63 1--------------------S-----s----*--h
    1 0.422 0.593 AS     4.63   7.38 1--------------------S-------------*
0.873 0.116 1.103 ASZ    7.13     15 1------------------s---*--s--s-----h
0.473 -0.06 0.493 ATI   20.25  30.25 1------------------*-S-s-----------h
0.918 0.344 0.481 ATR   20.25     30 1------------------S-----------*--h
0.458 -0.08 0.640 AVC    8.38  13.75 1------------------*--S-----r------h
0.937 0.218 1.017 BBC      14  28.25 1--------------------S--s---s*-s---h
    1 0.087 2.072 BCL   11.88   36.5 1------sR--*-----------------------h
0.558 -0.14 1.914 BCU    8.88  25.88 1-------------*-sr-rS--------------h
    1 0.458 0.765 BDK   17.13  30.25 1------------------Ss-------s------*h
0.148 0.006 0.573 BKS    20.5  32.25 1--------------------->-------------h
0.983 0.248 1.576 BMC       5  12.88 1--------------------S----s-s-*-----h
```

Another visual technique is the scatter plot shown in the third figure. Here, each stock is assigned an ascii symbol which is then positioned in the plane according to its OBVR and DIST coordinates. DIST is the horizontal axis, where we have placed "oversold" corresponding to DIST=0, and "overbought" when DIST=.5. (The reason for the latter choice will emerge when we develop the equation for an S/R level).

SCATTER PLOT IN THE PRICE - OBV PLANE

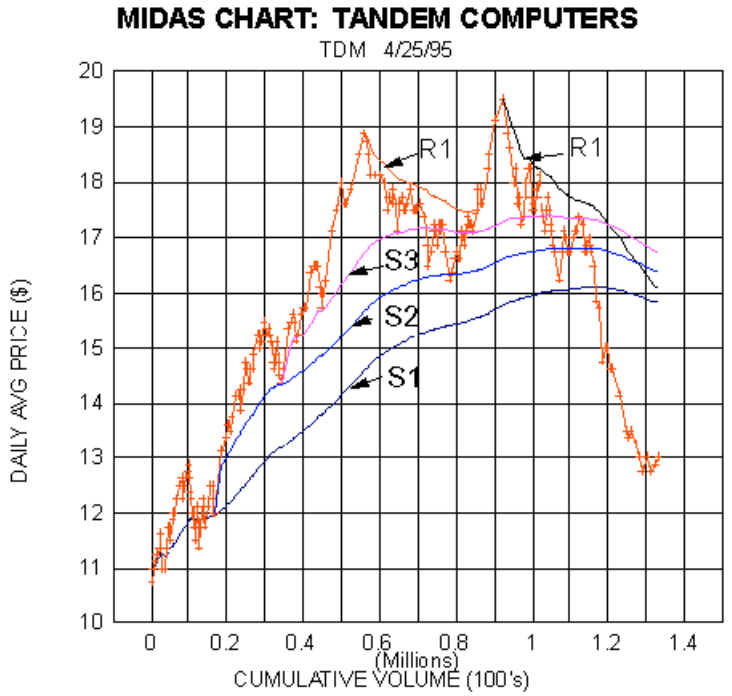


Since we wish to easily spot situations when a stock is close to S1 with a high OBVR, we need merely watch the region marked "sweet spot" and then have a closer look at the MIDAS charts for those stocks which show up there.

On a more sophisticated level, one can program customized trading systems based on MIDAS for inclusion in one of the many commercial trading software packages to do such scans automatically, aided perhaps by additional filtering using other tools of conventional technical analysis. I'll give some examples of this in a later article.

Our goal in the articles to this point has been to establish the credibility of the S/R hierarchy on the basis of its manifest ability to bring a degree of order into the apparently random zigzag patterns of stock prices. One measure of the power of any scientific theory is the degree to which many observations can be accommodated by the fewest principles ("Occam's Razor"). In the present context, this means fitting the set of trend reversal points - the zigzags - with a small number of S/R levels, all derived from a single simple algorithm (which will be derived in the article immediately following this one). For now we wish to exhibit a few final important properties of the S/R levels, and to discuss some limitations of the Midas method.

Turning first to the Midas chart for Tandem Computers (the obv curve was omitted so we can observe finer structural details of the price behavior) we have plotted a primary, secondary and tertiary support and two primary resistance levels. Note first that we discontinued the first R1 as soon as it was convincingly penetrated. S/R levels do frequently "wear out" for reasons which will be clear when we present the S/R algorithm. A new primary resistance level is introduced to accommodate the retreat from the second price peak.

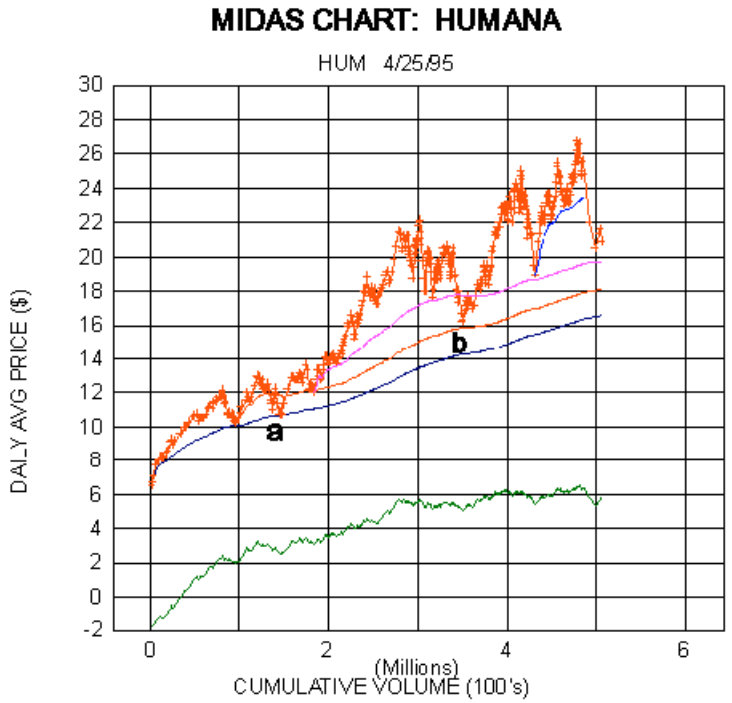


Next note that on the other hand, the support levels S2 and S3 maintained their viability (i.e. their ability to fit subsequent zigzags) after having been penetrated. Generally speaking, the older a level is, the more this tends to be the case.

Another interesting feature which can be seen in the S3 curve is the familiar property that a support level which has been violated becomes a resistance level when apporached from below. The reason for this behavior will also be clear when we derive the S/R algorithm.

Most importantly please take note of and remember the catastrophic failure of S1 to halt the price decline to below 13. This underscores the fact that the future is after all not cast in concrete. The perceived prospects of stocks are subject to abrupt and unforeseen changes. While an existing S/R hierarchy may be strong enough to bound the price variations within a given set of assumptions in the market regarding the prospects of the company, its group and the market as a whole, any sudden shift in this paradigm can call into a play a totally new price dynamic.

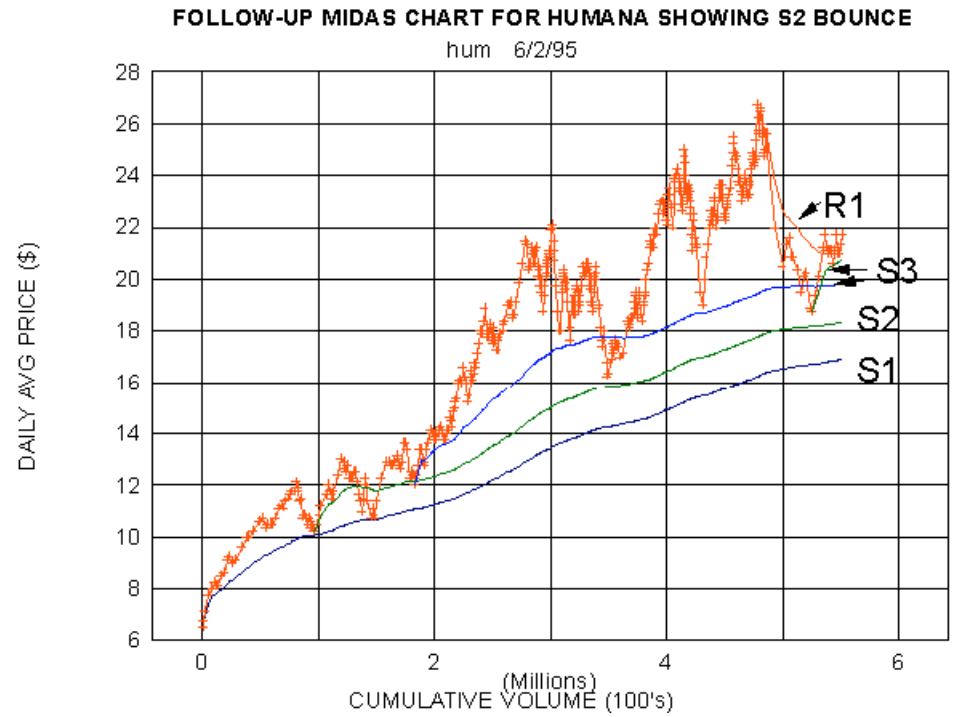
Fortunately, this is not always necessarily the case as may be seen in the Midas chart for Humana. Note first that as with Tandem, the level penetrations at points "a" and "b" did not invalidate their subsequent viability. More significantly, note that the recent sharp decline (brought about by a sudden reappraisal of all health care providers, or what we may call a group paradigm shift) was halted - at least for now - at a (mature and well-validated) S3.



Finally, to come full circle, in the first article we showed a conventional price and volume bar chart and followed it with a Midas chart of the same stock (Magma Copper). So now let's look at a bar chart for Humana upon which we have superimposed the Midas S3 support level. The results speak for themselves. The clear fact that so many apparently unrelated points of trend reversal can be understood with reference to a single theoretical S/R curve testifies to the power of the Midas method. Indeed, recalling the analogy in article #4 with atomic spectra, it is perhaps not too much of a stretch to view the Midas method as "price spectroscopy"!

POSTSCRIPT:

Article 6 was written on 4/25/95. In view of the delay in its publication, I thought it might be interesting to see what happened to Humana in the subsequent days. The results are shown in the fourth figure. Support was found at the secondary level S2 (actual low for the day was 17 7/8; recall that we plot the average price) and the bounce carried up through the incipient resistance level R1. Humana is now riding on a tertiary support level S3.



In the preceding six articles, it has been shown that the support and resistance levels associated with points of trend reversal in the price of a stock can be classified with respect to a hierarchy of theoretical curves. It is now appropriate to derive the simple algorithm giving rise to these curves from a consideration of familiar aspects in the psychology of the market participants. After all, it is precisely the dynamic interaction between the greed and fears of those who already hold the stock and those who wish to become owners that determines the price at which supply and demand find at least temporary equilibrium.

One can approach the problem from both the supply side and the demand side with remarkably similar results. First consider someone who already has a long position in a given stock. What will motivate this person (the "owner") to sell? If the stock is held at a profit, the more substantial this profit is the greater the temptation to take it. If - not having taken such profit - the owner sees the price has now dropped back almost to the purchase price, his propensity to sell is at a minimum because he is still in profit - albeit small - and believes the stock will at least partially retrace the higher prices of recent memory.

On the other hand, if the owner has been holding the stock at a loss, his overriding desire is to "get out even". Thus, as the stock price approaches from below the price at which he bought, his propensity to sell reaches a maximum. It is thus the purchase price which becomes either a support or resistance level for that owner; he either dumps the stock on the market or witholds it depending on the direction from which the market price is approaching his purchase price.

Now let's look at the demand side and consider the psychology of someone (we'll call him the "accumulator") wishing to take a substantial long position. He starts his buying and the price starts to rise attracting other buyers. Not wishing to "chase the stock", our accumulator holds off on future purchases until the price drops back to the average price at which he had assembled his position thus far. He can then buy more without substantially changing his aggregate cost per share. Thus, as the market price approaches from above towards his average cost, his propensity to buy reaches a maximum.

If his average cost happens to coincide with the average cost of the owner considered earlier, then it is little wonder that the price trend reverses at this point since the accumulator now starts to buy again while the owner has lost interest in selling. Supply and demand are maximally out of balance and the price must therefore rise sharply, i.e. "bounce".

In reality, of course, there are many "owners" with a corresponding spectrum of purchase prices. Similarly, while there may in fact be only a single "accumulator" in the initial stages of a bull move (e.g. a group of insiders, or a large institutional investor), as the move evolves distinctly different accumulators come on the scene (either traders attracted by the price action or other institutions recognizing the same fundamental "value" spotted by the initial investors). Each has their own time horizon, price objective, risk aversion, etc., and it is tempting to associate the hierarchal structure of S/R levels with such different groups of accumulators coming into the market at successive times.

To model this situation mathematically is quite complex. While one can certainly construct a purchase price spectrum from price and volume historical data, the decomposition of this spectrum into "owners" and "accumulators" would be tentative at best. Furthermore, at some point the psychology of the accumulator transitions into that of the owner. Above all, even if these complexities could be resolved, the modelling process would be multi-parametric (time horizon, risk aversion, profit objective, stop loss points, etc.)

As a first approximation, we can restrict consideration to just the first moment of the purchase price spectrum - the mean. That is, we simply ask "What is the average price at which this stock has been bought?" during a specific interval of time. Once this interval has been specified, the computation is trivial. One simply averages the daily prices
("price"=.5*(high+low)) weighted by the ratio of the daily volume to the total cumulative volume over the interval in question. If we use brackets to denote a simple arithmetic average, then the average price [P] is simply [PV]/[V].

We have not yet specified the interval over which the averages are to be taken. In fact, it is this CHOICE OF AVERAGING INTERVAL WHICH UNIQUELY DISTINGUISHES THE MIDAS METHOD. While even a casual reader of the earlier articles can already deduce the answer from the examples given, the rationale requires some discussion which is best left to the next article in the series.

8
In the preceding article we identified the theoretical support/resistance (S/R) level with the volume-weighted average price at the which the stock or commodity had changed hands during an as-yet-unspecified interval of time. In the same spirit of logical development, we now motivate the choice for this interval.

Consider the familiar case of a stock which has been dormant for a long period of time, trading in a narrow price band on relatively low volume. On a certain day it suddenly breaks out of the trading range on heavy volume and we ask where we might expect to find support during the inevitable pullback which follows when the buying spurt subsides. We have already said that the theoretical support will involve an averaging process from some initial instant (called the "launch point") to the present.

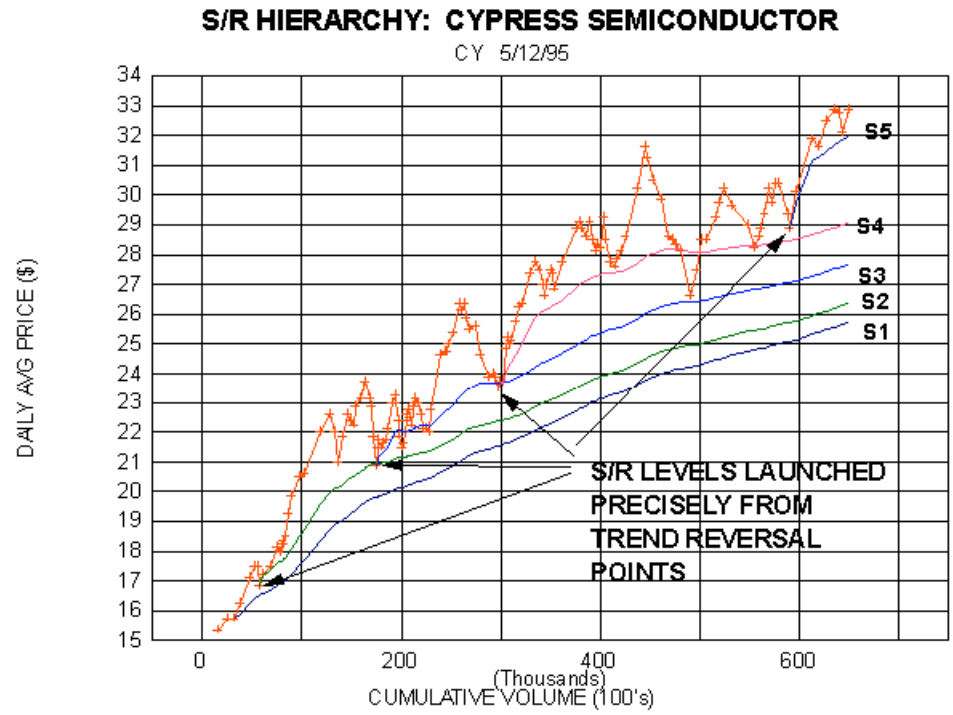
If the launch point includes days prior to the sudden breakout, the averaging will mix time periods of differing underlying psychology and thus would not be expected to yield useful results. For, clearly, the breakout day marked the beginning of a shift in the psychology of those subsequently acquiring the stock. In other words by and large people were buying the stock for different reasons after the breakout than before.

Similarly we can consider another familiar situtation where a stock has been in a long period of consolidation after an earlier bull move. Again, volume has shrunk to a mere shadow of previous levels. Then, one day, the stock starts moving up and trading volume accelerates. Here again the trend reversal is indicative of a reversal in underlyling psychology - else why would there have been a change in trend?

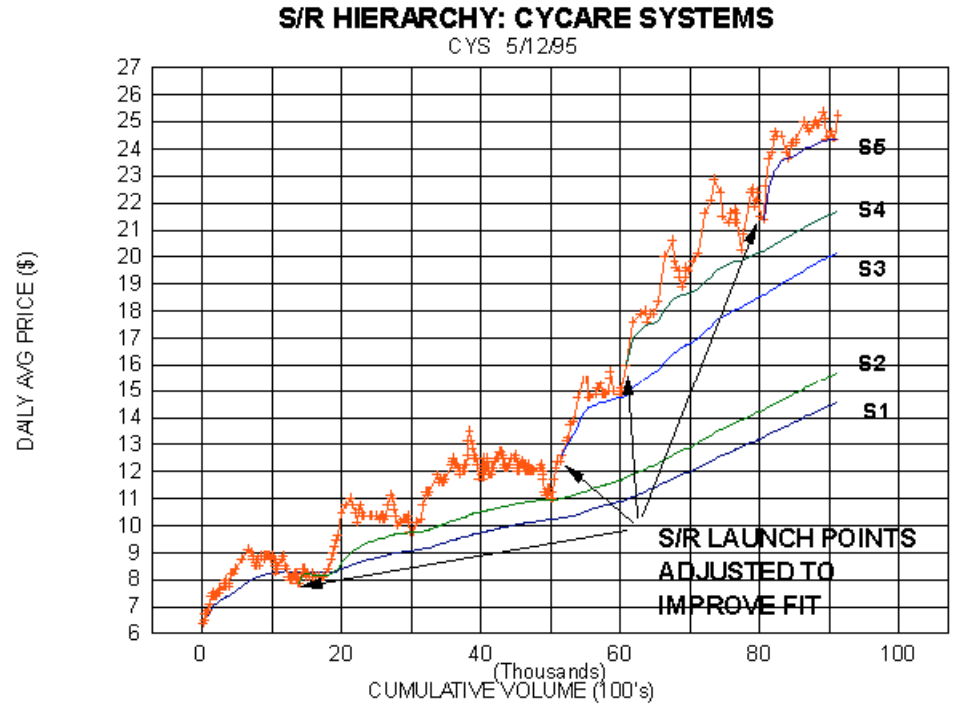
Thus it is clear that if the average price is to be a meaningful measure of psychological boundary, the average must be taken over a period of homogeneous psychology, i.e. subsequent to a reversal of trend. This is the key to the Midas method. By one of those unfortunate detours in the progress of technical analysis, attention came to be focussed on moving averages, i.e. price averages taken over a fixed time interval from the present to the past, an interval which had no connection to the underlying psychology of the market participants (except perhaps for a 6-month capital gains holding period).

Our "message" is that instead of "moving" averages, one should take fixed or "anchored" averages, where the anchoring point is the point of trend reversal.

By way of example, consider the Midas chart (obv omitted to focus on price alone) for Cypress Semiconductor. Here we have a five-fold hierarchy of theoretical support levels, where every member of the hierarchy is launched precisely from a trend reversal point. Thus an otherwise bewilderingly complex set of zig-zags in the price history can be understood with respect to a single algorithmic prescription: support will be found at the volume-weighted average price taken over an interval subsequent to a reversal in trend.



"Is this always the case?", one should now ask. In Count Dracula's immortal words when his hapless ovenight guests wished to leave: "Ahh, if only life were so simple!" Have a look at the Midas chart for Cycare Systems. Here we could achieve a good "fit" to the observed price zig-zags only by adjusting the launch points somewhat from their a priori values. In the case of S2, is was a matter of determining where in the midst of an extended consolidation bottom the launch point should taken. With S3 and S4, it involved a displacement of a day or two after the actual reversal day (a common situation in strongly trending stocks). (S5 could be viewed actually as an S6 - launched from the first pullback to an S5 which is not shown.)



In all cases, we attempt to understand the actual price zig-zags within a framework of the minimum number of theoretical S/R's. The launch points for this minimal S/R hierarchy are in the final analysis empirically determined. However, in most cases, the initial guess of launching the S/R's from the trend reversal points is good enough.

Having thus developed the rationale for the Midas method of technical analysis, we will henceforth get down to the computational nitty gritty. After the next article (if not by now) you should be generating your own Midas charts and forming your own conclusions!

The previous two articles have described how one computes the hierarchy of theoretical support/ resistance (S/R) levels upon which the MIDAS method of technical analysis is based. This description has intentionally avoided mathematical detail in order to focus on the conceptual foundations. We now turn to the actual equations and show how they can be readily evaluated in a spreadsheet.

Suppose the input data spans a consecutive period of N days. On any given day, say the i-th, we denote the high, low and volume as H(i), L(i) and V(i) respectively. These are the data that are actually used by MIDAS; we do not require the open, close or calendar date. (If the available input data only gives a single price - the close for example - then simply set the high and low equal to this price; if volume data is not available, set the volume for every day equal to the same value - say one share. Having less than complete input data is less than ideal but not a fatal drawback).

The first step is to compute for each day the average price P(i):

$$P(i) = .5*(H(i) + L(i))$$

Next, compute the cumulative volume for the i-th day, cumvol(i):

$$cumvol(i) = cumvol(i-1) + V(i)$$

That is we simply add the new day's volume to the cumulative volume at the previous day. To start this process, we set the cumulative volume initially to zero so that at the end of the first day cumvol(1) = V(1).

In a similar fashion, also compute the cumulative product of the daily price and daily volume. Calling this cumpvol(i), we have

$$cumpvol(i) = cumpvol(i-1) + P(i)*V(i)$$

Again we start cumpvol at zero, so that at the end of the first day cumpvol(1) = P(1)*V(1).

Finally, the on-balance volume for the i-th day, obv(i), is computed from the equation

$$obv(i) = obv(i-1) +sgn(i)*V(i)$$

where the "sign" function, sgn(i), is defined by

$$sgn(i) = +1 \text{ if } P(i) > P(i-1)$$

$$sgn(i) = -1 \text{ if } P(i) < P(i-1)$$

$$sgn(i) = 0 \text{ if } P(i) = P(i-1)$$

We arbitrarily choose sgn(1)=1 on the first day so that obv(1)=V(1).

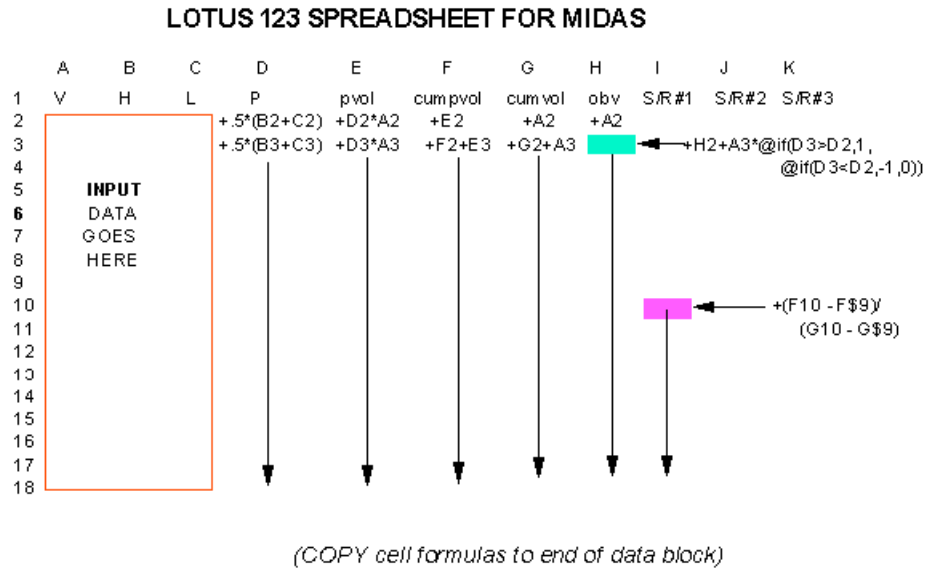
The MIDAS chart is then constructed by plotting two separate (i.e. non-overlapping) graphs, one placed vertically above the other so that their x-axes are parallel. In the upper graph, plot P(i) as the y- coordinate versus cumvol(i) as the x coordinate. In the lower graph, use the same x coordinate (i.e. cumvol(i)) and plot obv(i) as the y coordinate. Thus every day gives rise to a single x-y point in each of the two graphs. Connecting the sequential points in each graph thereby traces out curves of price vs. cumulative volume in the upper graph and on-balance volume vs. cumulative volume in the lower graph.

The last step is to plot the theoretical S/R curves on the same graph that has price vs. cumulative volume. The equation for computing the value on the i-th day of an S/R level "launched" on the j-th day (call this S/R(i , j) is simply:

$$S/R(i , j) = (cumpvol(i) - cumpvol(j)) / (cumvol(i) - cumvol(j))$$

That's all there is to it! One just interactively chooses a set of launch points until an S/R hierarchy is (hopefully) found which makes sense of the historical data, the initial launch point guesses being the days of observed reversals in trend.

An easy way of carrying out these calculations in practice is through the use of a spreadsheet. Below I show how this could be done in Lotus 123 (other spreadsheets will be similar if not identical).


LOTUS 123 SPREADSHEET FOR MIDAS
A B C D E F G H I J K
1 V H L P pvol cumpvol cumvol obv S/R#1 S/R#2 S/R#3
2 +.5*(B2+C2) +D2*A2 +E2 +A2 +A2
3 +.5*(B3+C3) +D3*A3 +F2+E3 +G2+A3
+H2+A3*@if(D3>D2,1,
@if(D3<D2,-1,0))
INPUT
DATA
GOES
HERE
+(F10 - F$9)/
(G10 - G$9)
(COPY cell formulas to end of data block)

Simply enter the input data in the first three columns starting with the second row, and enter the cell formulas as shown in rows two and three. COPY the third row downward for as many days (rows) as there are input data. If an S/R level is to be launched from a given row - say the 9-th - (e.g. because the value in the "P" column reached a local maximum or minimum at that row) then in the very next row (row 10) enter the following formula in column I (the one labelled S/R#1):

+(F10 - F$9)/(G10 - G$9)

COPY it downwards to the last row of the data set. Note that the $ is very important since it "anchors" the S/R level to the launch point (row 9 in the current example). Additional S/R levels can be similarly launched in columns J, K, etc. as the occasion demands.

Finally, using the graphing capabilities of the spreadsheet, create a pair of x-y type graphs. In both graphs, choose the x coordinate as the "cumvol" column (G in the present example). In one of the graphs, the price vs. cumvol curve is generated by taking the y coordinate from the "P" column (column D) and the S/R curve(s) from columns I (et al). In the other graph, take the y coordinate from the "obv" column (column H in the figure).

From a practical standpoint, the time-consuming element is loading the input data into the first three columns. Those who are already using a spreadsheet to perform technical analyses will presumably have automated this process so the addition of MIDAS should present no difficulties. Others may be using a commercially available charting software package which both imports historical data automatically and allows for user-defined custom formulae or "indicators". In the next article I will show how MIDAS can be integrated into one such package.

POSTSCRIPT:

We are now approximately at the "midterm" of what I view as a course here at Cybercollege, one in which you have enrolled by sticking with the articles to this point. Your midterm "exam" is simply to provide me with some feedback: what you like and dislike about the articles, any points you found unclear or particularly enlightening, and in general any comments which may assist me in making the remainder of the course as useful as possible to you. On a personal level, a brief biographical paragraph would also assist me in visualizing the faces on the other side of my modem... Thanks.

10

The tools have now been provided to analyze stock price behavior relative to the theoretical hierarchy of support/resistance (S/R) levels. How to use these tools to improve one's trading performance -the "engineering" aspect of MIDAS- is the focus of the present article.

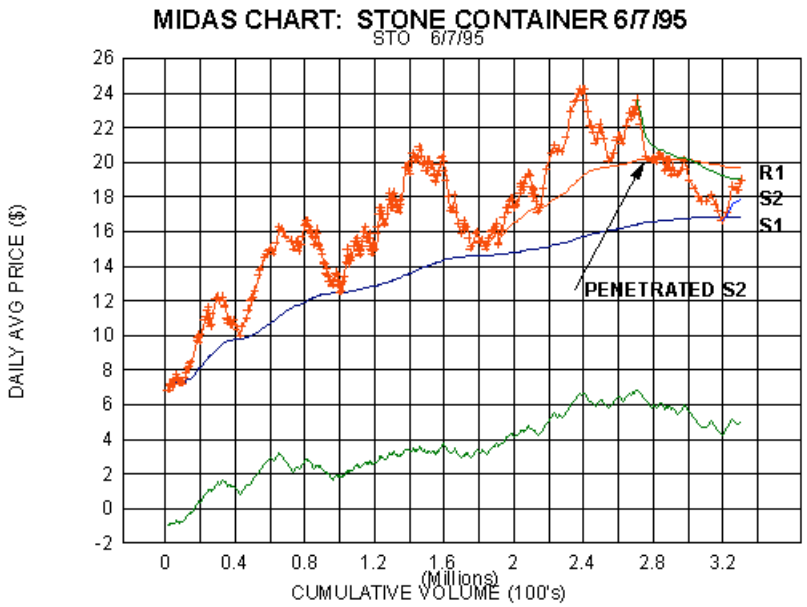
To paraphrase Hamlet, the basic question is "to bounce or not to bounce". Our theory predicts where a bounce (i.e. a trend reversal) should occur, and if it does occur, where such a bounce should carry to as a

minimum objective. But, since the market is in the final analysis probabilistic rather than deterministic, our decision whether to trade an expected bounce - by buying at the theoretical support and selling at a theoretical resistance - will require some ancillary assessment of the likelihood that the support level will in fact hold.

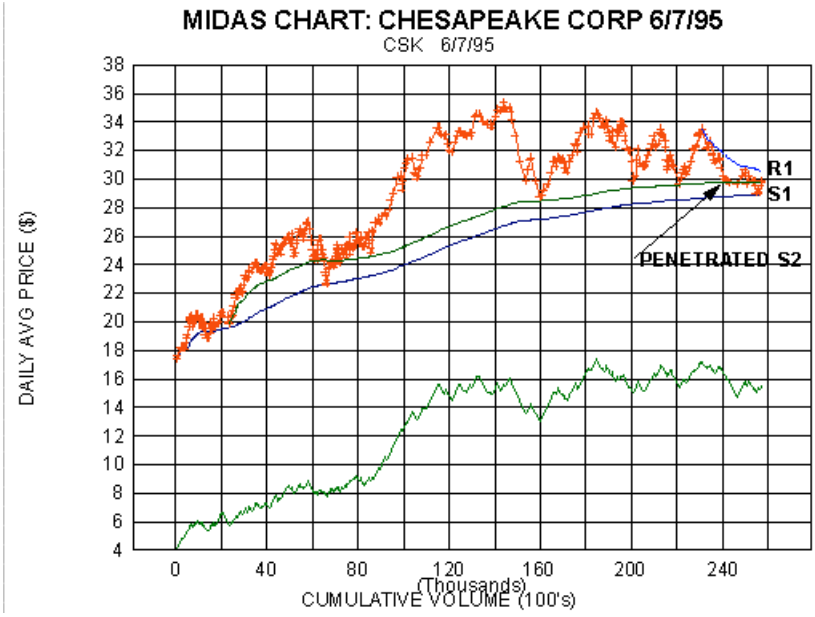
In the familiar and apt analogy between the stock market and the motion of a cork floating on the sea, one associates the broad tidal motion with the influence of the overall market on a particular stock. Superimposed on the tide are individual waves which are analagous to the effect of the group (i.e. computers, cyclicals, golds, etc.) to which the stock belongs. Finally there is the microenvironment of ripples and wisps of wind which relate to the particular dynamics of the stock itself.

Relegating to a later article the important topic of the application of Midas methods to the overall market, we look to the other two factors for the clues we seek. Specifically, we can examine Midas charts for two or more stocks in the same group on the assumption that one of them will provide a leading indicator of the group's behavior. Also, for a single stock we can consider the Midas techniques in concert with other tools from conventional technical analysis, seeking independent confirmation that a tradable bounce may be at hand.

To pursue the group angle, we consider two paper product stocks: Chesapeake Corp. and Stone Container. The Midas chart for Stone Container updated to the time of this writing is shown in the first figure. The astute reader will recall that we visited STO before (in article #2), at a time roughly corresponding to the tip of the arrowhead in the figure. To recall our exact words: "...the expectation is that the secondary (i.e. S2) will hold and the price will resume its upward motion. If the secondary fails to hold, the price would be expected to decline at least to the primary support level at about 17." In the event, the secondary did hold for some time and then ultimately failed after which support was found precisely at S1. The subsequent bounce has carried to the expected minimum objective, the resistance level R1, and at this moment is attempting to penetrate it.



Now look at the Midas chart for Chesapeake Corp.Now look at the Midas chart for Chesapeake Corp. As with STO, the S2 support was penetrated after holding for some time, and a bounce has started from the S1 level. It, however, has not yet carried as far as R1 and in this regard is lagging behind STO. If STO in fact is subsequently able to convincingly penetrate its R1, then this would give incentive to buy CSK since the implication is that the paper stocks have completed their correction and are about to start a new bull leg.



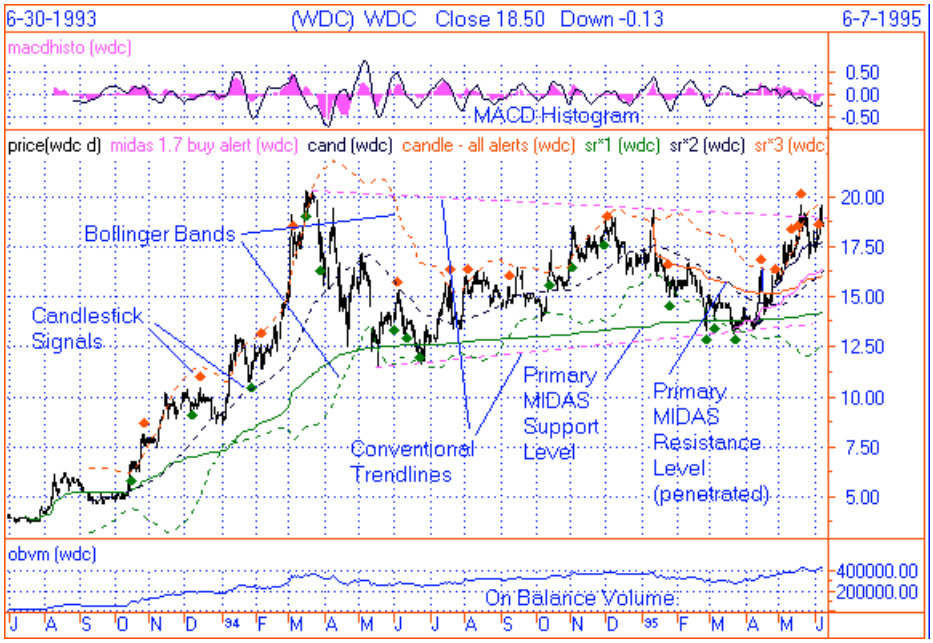
Turning now to the concept of synergistically combining Midas methods with other techniques of technical analysis, this gives us an opportunity to redeem the promise made at the end of the previous article to show how Midas can be integrated into existing commercially available charting software. Windows on Wall Street (tm), a product of Market Arts Inc., is one such package which automates the importation of daily updates or historical stock data and allows the user to produce charts incorporating a variety of standard tools of technical analysis. As with other similar products it also permits the introduction of user-defined curves (or "custom indicators") to be plotted on the same graph as the price data. Unfortunately, however, in common with all such packages (of which I'm aware) one is limited to plotting vs time rather than vs cumulative volume.

Nevertheless, it is quite simple to plot S/R levels using these packages. In the case of Windows on Wall Street, one merely defines the following "custom indicator":

CUM(.5*(H+L)*V*IF(CUM(1)>DAYS,1,0)) / CUM(V*IF(CUM(1)>DAYS,1,0))

where DAYS is a parameter equal to day (i.e. record) number at which the S/R level is to be launched. (Defining several such indicators, labelled S/R#1, S/R#2, etc, permits as many S/R curves to be simiultaneously plotted as one wishes). A particularly useful feature is that since DAYS is an adjustable parameter, one can readily shift the launch point around by simply clicking on the S/R curve with the mouse, and then clicking on a parameter-change button.

More importantly, one can combine on one graph other indicators and technical aids together with the Midas S/R levels. The third figure gives an example of this for Western Digital (WDC). Here we have defined three windows, one for an MACD histogram, one for on-balance volume, and the main window for the price and other technical aids. In addition to three Midas S/R levels, we have included conventional trendlines (straight lines joining peaks and troughs), so-called Bollinger Bands (2 standard deviations above and below a moving average of price), and bullish (green) and bearish (red) flags derived from Japanese Candlestick pattern recognition software.



Focus particular attention on the March 1995 time frame. The price has consolidated down to the primary (S1) Midas support with a degree of porosity similar to the previous contact (in May-June 1994). When the three bullish candlestick signals appeared, this became a compelling buying opportunity (especially the third such signal at which time the price was simultaneously at both the trendline and the lower Bollinger band).

The key to profitable trading using Midas is to have a sufficiently large number of stocks under surveillance, so that when such "golden opportunities" come along - as they surely do from time to time - one can recognize them as such and concentrate enough buying power on one's position to take full advantage of the situation. This leads naturally to the question "when should I sell?". We'll discuss that in the next article.

11

The insights into the underlying structure of price behavior provided by Midas should be viewed as yet another instrument in the toolbox of the technical analyst. By itself, Midas is not the key to instant success in trading; but when used skillfully in concert with other techniques that one has already found to be useful, it can provide the additional edge that is needed in what has become an increasingly sophisticated and competitive zero-sum game.

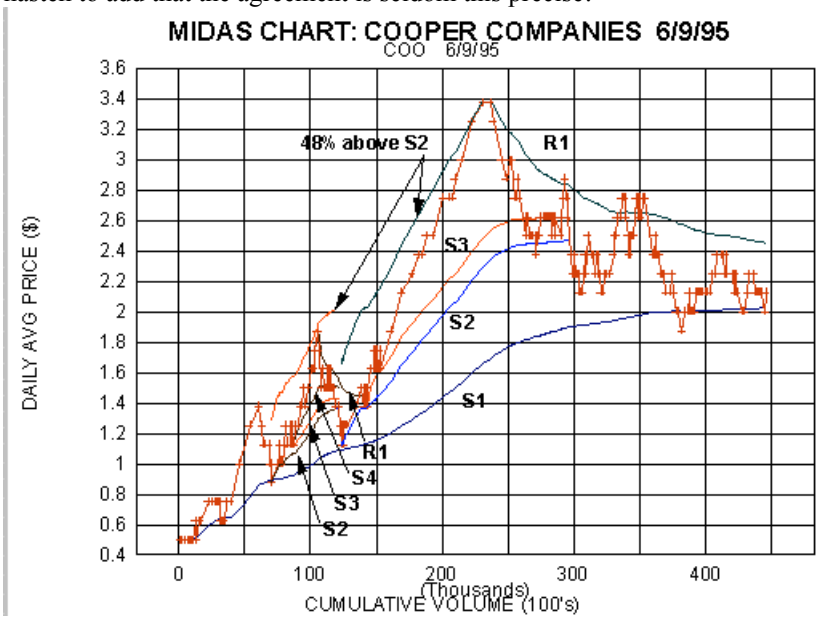
In the previous article, we have seen how intragroup comparisons and synergistic use of other tools can increase one's chances of identifying potentially profitable trend reversals. (While we have emphasized entry points for long positions, the inherent symmetry between support and resistance hierarchies in the Midas method allows the same methodology to be used in trading the short side). Having thereby determined "when to buy", we raised the companion issue of "when to sell". In the course of examining this question we will come to recognize some more fundamental structural orderliness in price behavior - i.e. beyond the mere existence of the S/R hierarchies.

In the early articles we have already cited some qualitative indications that a bull move is running out of steam: deterioration of the obv curve (i.e. obv starts to trend downwards while the price is moving sideways) or the appearance of fourth, fifth and even higher order S/R levels. Now we know to watch out also for bearish indications in the peer group of stocks, and for ancillary signals such as trend line penetration, classic chart reversal patterns (e.g. "head and shoulders'), and Japanese Candlestick alerts.

But does Midas itself have anything new to contribute in identifying sell points? If one is trading a bounce from a theoretical support level during a pullback from a recent high, we have already seen many times that the theoretical resistance level "launched" at that high is a viable price objective for the bounce. This is evident in the Midas chart for Cooper Companies, for example, in the bounce from S2 to R1 at a cumulative volume of about 290,000 (round lots).

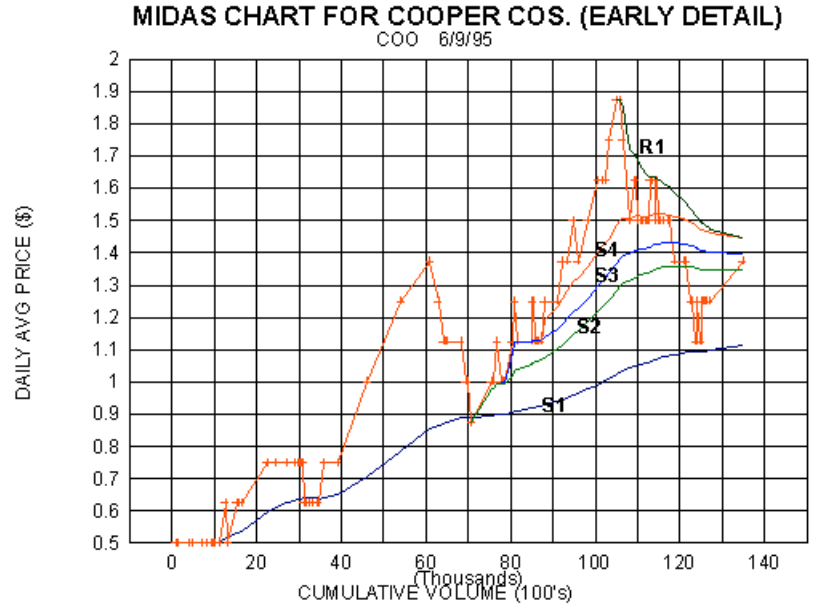
I have chosen COO as an example because it has other lessons to teach. Note the lines labelled "48% above S2". What we have done here is to ask the question "how high did the previous bull leg (the one peaking near a cumulative volume = 100) go when expressed as a percentage above its secondary support (S2)"? This turned out to be 48%. We then apply the same percentage (what I call the "greed factor") to the S2 for the next

leg to obtain a (moving) price target. Sure enough, the peak of the next leg occurs where anticipated, although I hasten to add that the agreement is seldom this precise!



We are exploiting the circumstance that successive bull moves are frequently self-similar when viewed in the context of the S/R hierarchy. Thus, if price excursions are measured relative to the theoretical support levels, different bull moves can be directly compared notwithstanding the fact that they may occur over vastly different scales of cumulative volume.

To pursue this point further, in the second figure we present a magnified view of the bull move peaking near cumvol=100. Plotted on the figure is a fourfold hierarchy of support levels and the primary resistance level launched at the peak. The important point to note is that although we are only dealing with 54 days of data (between cumvol= 70 and 125), there is nevertheless exhibited the same hierarchal structure that one finds in charts extending over several years. In other words, the zigzags in price behavior that one observes on short time scales have the same structure (in S/R hierarchal terms) as that seen on long time scales.



The foregoing properties of self-similarity and scale independence are characteristics of fractal behavior. The fractal nature of stock price fluctuations has been recognized for some time on purely empirical grounds. What has been missing is an understanding of why markets should behave fractallly (i.e. beyond the obvious fact that they are complex non-linear dynamic systems). In the Midas method, we have seen that the complex zigzags in price behavior can be (to quote article#8) "understood with respect to a single algorithmic prescription: support (or resistance) will be found at the volume- weighted average price taken over an interval subsequent to a reversal in trend". The psychological elements of greed and fear, whose quantification led to this algorithm, apply to investors/traders across all time scales. (Someone who has held a stock at a loss for

three years is just as eager to "get out even" as the day trader who is holding a losing position).

There is even a more remarkable method of predicting tops (and bottoms) in the Midas bag of tricks - the so-called TOPFINDER algorithm. Don't miss the next article!

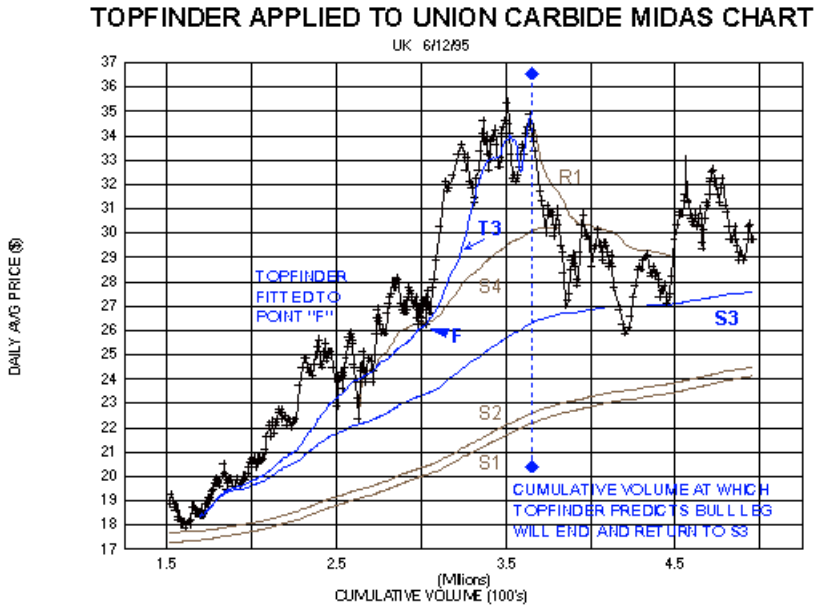
12

The truly new insights provided by the Midas method are twofold. The first is the heretofore unrecognized hierarchal structure of support/ resistance levels and their a priori prediction in terms of the volume- weighted average price taken over an interval subsequent to a trend reversal point. The second, to be introduced in the present article, is that there frequently exists a remarkable underlying structure which dominates or "guides" the bull or bear move as it develops from that point onwards.

This structure is revealed when actual prices are compared to a new type of theoretical support/resistance curve generated by what I call the TOPFINDER algorithm. (We expose our taurine - as opposed to ursine - leanings as "BOTTOMFINDER" would be equally appropriate since the support/ resistance symmetry applies to the new algorithm as well as the S/R hierarchy). In presenting TOPFINDER, we will follow the same pedagogical path used up to now. To whit, without initially revealing the TOPFINDER equation, we will show what are hopefully compelling demonstrations of its power. The next steps in the program would then be to outline the psychological principles underlying the mathematical structure of the algorithm, followed by the display of the algorithm itself.

In the present instance, however, the situation is reversed. I discovered TOPFINDER empirically, and while I have some ideas as to the underlying principles and mechanisms giving rise to its applicability (which I will put forth in due course), it is still a subject for conjecture and research. Indeed, perhaps one of you will come up with a useful approach!

To begin, then, let us turn to the figure wherein we revisit Union Carbide. Recall from the fourth article that following an extended period of "foothill" behavior where UK found repeated support at S2, it abruptly took off in a doubling move during which support was found at successively higher order levels - culminating with S5. In time, this dramatic bull move ended and the price returned to the S3 level which was launched at the start of the move.



In the figure we show a new curve labelled "T3", which is launched concurrently with S3. As with the S/R levels, this TOPFINDER curve is generated by a simple universal algorithm , now containing two parameters to be determined by fitting to the trend reversal points. As before the first parameter is the launch point. In TOPFINDER, the second parameter represents the duration of the move as measured in cumulative volume.

In other words, TOPFINDER is predicting that the move which started with the launch of S3 will, if the move fulfils its "destiny", terminate when the cumulative volume reaches the value indicated by the dashed line joining the diamonds, after which the price should return to the more "normal" (i.e. unaccelerated) support S3. It is seen from the figure that if T3 is fitted to the consolidation reversing at point "F", then the end of the entire bull move is for all intents and purposes predicted exactly!

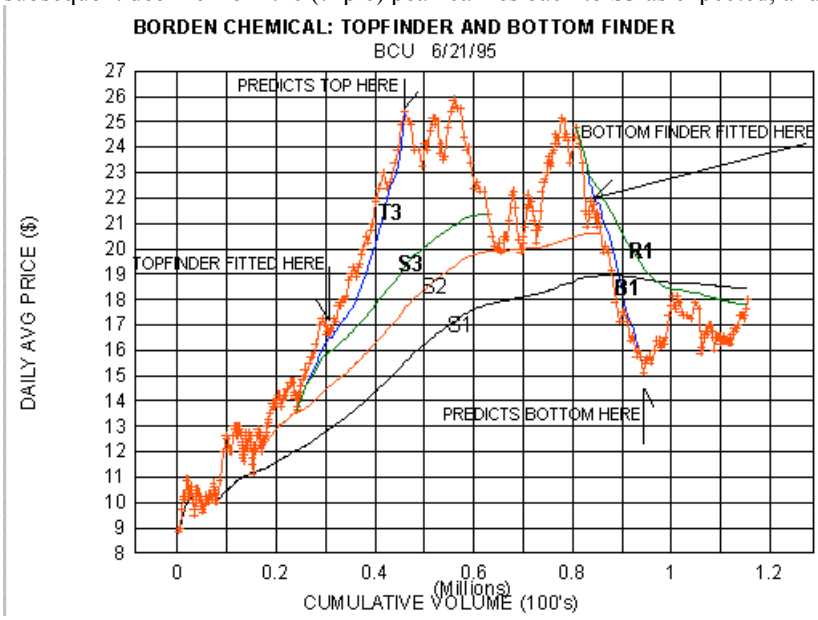
Since technical analysis is often referred to these days as "rocket science", we can employ this metaphor by likening a move in a stock to a rocket launch. Already we have referred to a trend reversal as the "launch point"; now we imagine that - as with a rocket - the move's duration is pre- programmed by loading a

given amount of "fuel" which in our case is a fixed amount of cumulative volume. During the powered phase of the launch, the rocket's control mechanisms act to follow the nominal trajectory defined by the TOPFINDER curve. When the fuel is completely burnt, the rocket returns to the Earth's surface represented by the S/R level.

In the market, as with rockets, there are abortive launches which do not go all the way to burnout, but return to Earth prematurely. Hence the TOPFINDER curve (and especially the predicted burnout point) are to be regarded only as potentialities. So the new viewpoint is that every time there is a bounce from an S/R level of order "n", we begin the computation of two new curves: the next higher- order S/R level (order "n+1") and the corresponding TOPFINDER labelled with the same index. The move originating with the bounce has the potential to "take off" (i.e. accelerate) in which case its trajectory is predicted by TOPFINDER. Or, it can fail to "ignite" in which case it merely rides along the newly launched S/R level in a succession of less dramatic "hops" before either attempting a new takeoff- or penetrating the level and dropping back down the hierarchy.

Returning to Union Carbide, I ask you - the jury - to disregard the dip to the S3 level occurring at a cumulative volume of about 2.6. (This was a one- day affair at the climax of a 6-day 300 point drop in the Dow in late March/ early April of 1994). With this point thus ignored, it is seen that TOPFINDER - while explicitly fitted to point "F" - simultaneously does a good job of accommodating all of the pullbacks from the start of the move through the dip to 31 at a cumulative volume of about 3.3. (The subsequent penetrations of the TOPFINDER curve as the burnout point is approached are of no consequence and a frequent occurrence for reasons which will become clear when we exhibit the algorithm in a later article). In this sense TOPFINDER may truly be regarded as the guide curve for the entire price-doubling bull move.

A second example - perhaps more striking in that no appeal to forbearance is required - is afforded by Borden Chemical and Plastics (BCU) in the second figure. Here the TOPFINDER/BOTTOMFINDER symmetry is explicitly exhibited. On the way up, TOPFINDER T3 accurately locates the top of the accelerated near- doubling move connected with the launch of S3, when fitted to the first consolidation pattern. The subsequent decline from the (triple) peak carries back to S3 as expected, and even beyond to S2.



Later, after another rally to the area of the previous peak, BCU undergoes a precipitous decline which is well described by the BOTTOMFINDER curve B1, launched in conjunction with the primary resistance level R1. Again, when B1 is fitted to the first pullback, the cumulative volume at which the bottom occurs is accurately predicted. The subsequent pullback to R1 also exactly follows the script.

It should be emphasized that applications of TOPFINDER (and BOTTOMFINDER) are relatively infrequent, yet quite striking when they do appear. Generally speaking, whenever a bounce accelerates to new highs before pulling back fully to the expected (i.e. newly launched) S/R level, one should launch a TOPFINDER, fitting it (provisionally) to the pull-back point. If the move continues to trend strongly without pullback to the S/R level, continue the TOPFINDER, perhaps iteratively readjusting the fitting point as the move matures towards the expected burnout cumulative volume.

Further examples of this remarkable new feature of price behavior will be given in the article to follow, after whiich we will present the underlying algorithm and speculations as to its basis.

POSTSCRIPT:

In article#10, we gave a formula for introducing S/R's as custom indicators in WIndows on Wall Street. From readers' comments it is clear that I should have emphasized that DAYS is a constant set by the user to coincide with the launch point, being actually the number of records from the beginning of the data file. One reader, Stacie Crummie, discovered that with the following slight modification (to avoid division by zero problems prior to launch) , this formula can be used in the more popular Metastock software:

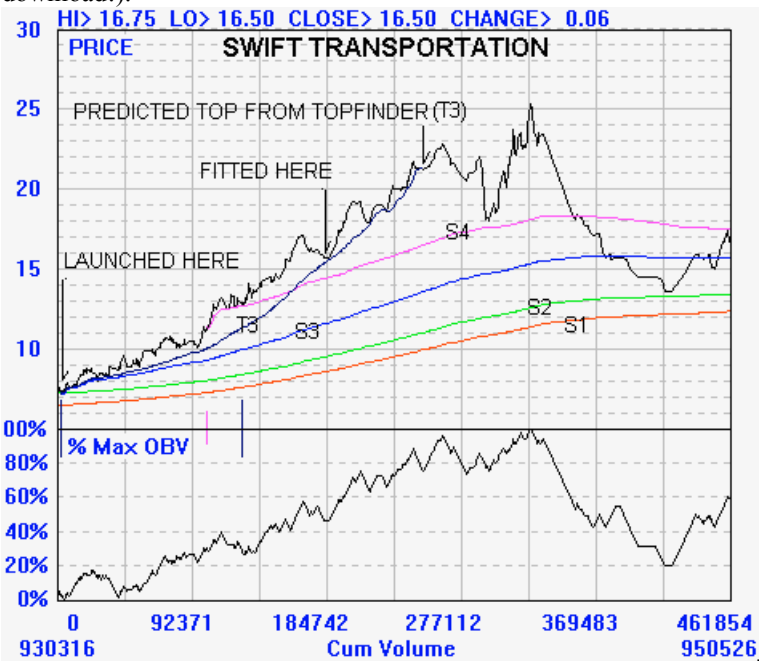
cum(if(cum(1)<"days",0,mp()*v))/cum(if(cum(1)=1,1,if(cum(1)<"days",0,v)))

Here mp() is the mean price function, replacing our .5*(high+low). Thanks Stacie.

13

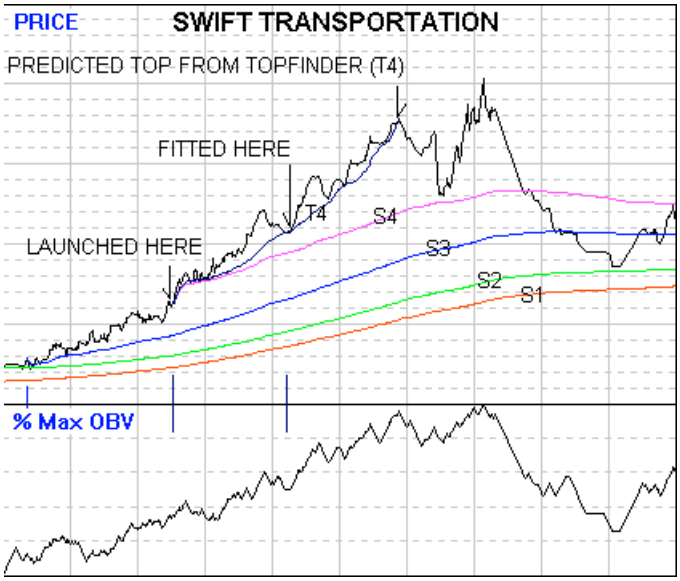
In the previous article we introduced the concept of TOPFINDER (or BOTTOMFINDER) wherein a strongly trending move finds support (or resistance) on pullbacks at a new type of S/R curve which accelerates away from the normal S/R and terminates at a predetermined cumulative volume. In order to recognize the types of Midas curves for which TOPFINDER may be applicable, it is worthwhile to examine a few more examples before we present the algorithm and consider its implications.

The first figure contains a Midas chart for a massive bull move and subsequent bear correction in Swift Transportation. In contrast to the Midas charts you have seen thus far (which are generated by a Lotus 123 spreadsheet program I initially wrote for the HP 95LX pocket computer) this figure is obtained from a Windows application called WINMIDAS which we will discuss in a future article (and possibly even have available for download!).

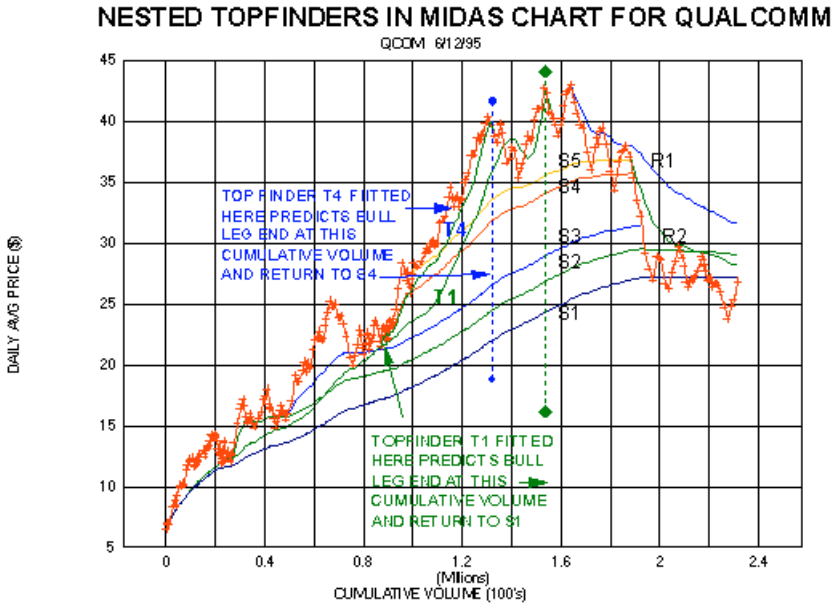


Per the comments in the previous article, after launching S3 and observing that the price failed to pull back to S3 - trending instead strongly upwards - a TOPFINDER curve T3 was launched as well. As the move evolved, the point at which T3 was fitted to the various pullbacks was refined until the final fitting point shown in the figure was used.

Note that the subsequent pullbacks were well fitted by this TOPFINDER curve but that the predicted burnout was a bit premature. Furthermore, the subsequent correction went only as far as S4, rather than S3. Was this a failure of the theory? Not quite, for (as shown in the second figure) when we go back and launch the TOPFINDER T4 associated with S4 - again fitting it to the same pullback as with T3 - we find lo and behold that with T4 the burnout point shifts to the right just enough to catch the actual top!



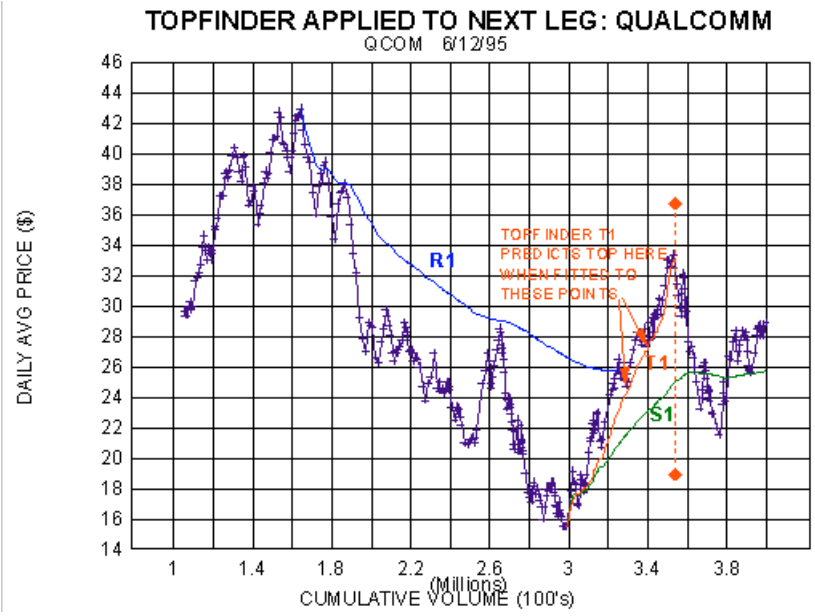
So apparently just as there are short term bull moves contained within longer term ones, TOPFINDERS associated with different members of an S/R hierarchy can be simultaneously operative. This is clearly shown in the third figure which is an (older style) MIDAS chart for Qualcomm (QCOM). Note first that the TOPFINDER T1, associated with the primary support level S1, catches the climax of the whole bull move quite well (actually the first of the double-top formation).



Yet within this "six-bagger" move from 7 to 43, was a near doubling move from about 22 to 41 associated with the launch of S4. If the corresponding T4 is plotted, it is seen that the intermediate top is located quite well when T4 is fitted to the short term pullbacks as shown. (In the event, the subsequent correction carried only to S5 rather than S4 as anticipated, but this deviation from form could be interpreted as a complication arising from the fact that the T1 had enough "fuel" left to counteract the decline from the T4 peak.)

The foregoing examples underscore the circumstance that application of TOPFINDER techniques frequently involve ambiguities either in the choice of launch and "fit" points, or in the possibility for more complex simultaneous structures. While a regrettable frustration in our search for the magic wand that turns all to gold, there do occur "textbook" examples devoid of such complications which have great profit potential.

So to end on this positive note, let's go a bit further with QCOM and look at the next bull leg - another double from 16 to 32. As seen in the fourth figure, the straightforward T1 associated with the new S1 works like a charm catching the top exactly. So something is clearly going on here and in the next article we'll examine the TOPFINDER algorithm and try to understand why it works.



14

Strongly trending price moves are distinguished by their motion away from the theoretical S/R level launched at the start of the move. In several examples we have seen how these accelerated moves find support (resistance) at a TOPFINDER (BOTTOMFINDER) curve which frequently has the ability to predict the cumulative volume at which the move will end. In this article we present the TOPFINDER algorithm and discuss its implications.

To understand TOPFINDER, it is worthwhile to rewrite slightly the algorithm used to generate the S/R levels. In the first figure we collect all of the MIDAS algorithms, written in their most useful form. The S/R levels are given by the quantity called "P-Bar-Star", where P stands for price, Bar for average, and Star being an acronym for "subsequent to a reversal". By this device, the symbol itself - when given its mathematical pronunciation - describes how it is to be computed (the average price subsequent to a reversal)!

MIDAS ALGORITHMS:

Definitions:

$\bar{P}^{*}_{ij}$ = value on day # i of S/R level "launched" on day # j
("P-BAR-STAR": "P" = price; "BAR" = average
"STAR" = Subsequent To A Reversal)

$\hat{P}_{ij}$ = value on day # i of TOPFINDER "launched" on day # j
("P-HAT": "HAT" = Hitting A Top)

P_i = average price on day # i = .5*(High + Low)

V_i = Volume on day # i

x_i = cumulative volume on day # i = $\sum_{k=1}^{i} V_k$

y_i = cumulative price*volume on day # i = $\sum_{k=1}^{i} P_k * V_k = y(x_i)$

d_{ij} = cumulative volume difference between days ≠ i and j
= $x_i - x_j$

Equations:

$\bar{P}^{*}_{ij} = [\, y(x_i) - y(x_i - d_{ij})] / d_{ij}$

$\hat{P}_{ij} = [\, y(x_i) - y(x_i - e_{ij})] / e_{ij}$; $e_{ij} = d_{ij} * (1 - d_{ij} / D)$

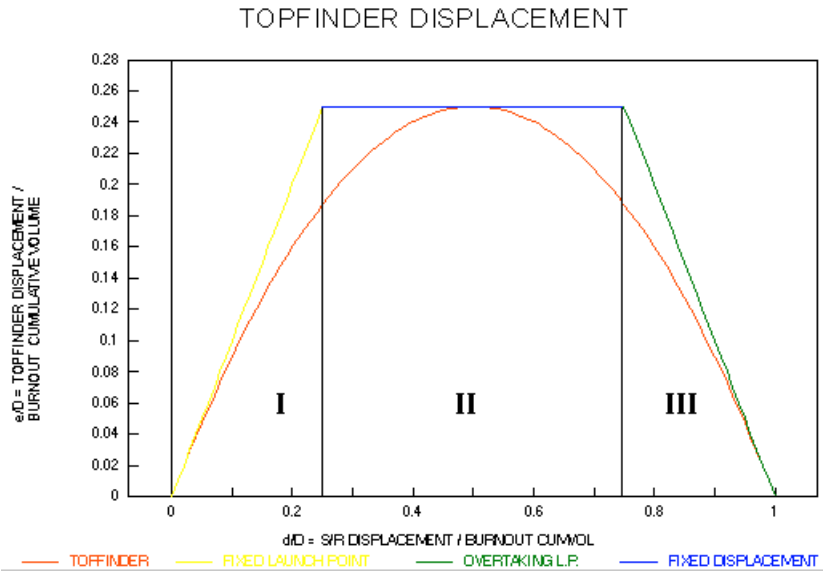
From the equation for P-Bar-Star, it is seen that it is now expressed in terms of the cumulative volume difference (or "displacement" as we shall call it) between the launch point and the point of computation. The S/R level is simply the cumulative price*volume at the given instant minus the cumulative price*volume at a point d units of cumulative volume earlier, all divided by d, where d is the displacement measured from the (fixed) launch point.

We now define a new quantity called "P-Hat", where "Hat" is now an acronym for "hitting a top". P-Hat is the TOPFINDER (or BOTTOMFINDER) curve, and is computed by an equation which looks very much like that for P-Bar-Star. The difference lies in the relationship between the effective displacement, e, used in the P-Hat equation and the displacement, d, used in the P-Bar-Star equation. Specifically, e is related to d parabolically through the equation e=d*(1-d/D). D is now a new parameter which we shall call the "duration" of the move since

e goes to zero when d approaches D.

The TOPFINDER algorithm (i.e. the equation for P-Hat) simply says that instead of keeping the launch point fixed (as with P-Bar-Star) one allows it to move forward in time towards the present. In effect the launch point can be visualized as chasing the present, finally catching up when the D units of cumulative volume have built up subsequent to the starting launch point. Putting it another way, as the move uses up its allotted duration, the topfinder curve represents an average price taken over successively shorter intervals, whereas the S/R level is an average taken over successively longer intervals.

This is illustrated in the second figure which shows the relationship between e and d. We have drawn the actual parabolic curve for e, as well as three linear tangents and their corresponding cumulative volume "zones" I,II, and III. In zone I, the start of the move, e and d are very close to each other so the topfinder launch point, while actually moving away from the starting launch point, doesn't move very far. The TOPFINDER and S/R urves are thus close to one another in this initial zone. (Indeed, it is the failure of the price to pull back fully to the S/R curve, that alerts us to the fact that topfinder is coming into play since a shorter displacement than d is required to "fit" the actual price pullback).



In zone II, the topfinder displacement is roughly constant at a value close to one-quarter of the duration D. If D were 100,000 shares, for example, then in zone II the price is finding support (or resistance) at a price average taken over the past 25,000 shares. This is behaving, in effect, like a conventional moving average, taken over a fixed number of shares rather than a fixed number of days.

In zone III, the effective displacement is rapidly diminishing. In fact, to a first approximation, for every new share traded while in this zone, the averaging interval shortens by one share. It is this remarkable feature of the climactic end of the move that gives us a clue as to what might be going on.

Let me describe one situation which would lead to this type of behavior. Forget for the moment that we are discussing stocks or commodities and imagine that you are a dealer in collectibles (coins, fine art, etc.) You decide that, say, snuff boxes which are now in very little demand could be promoted into a fashionable collectible. So what do you do? First, very quietly so as not to tip your hand, you start buying up all the snuff boxes that come on the market. This is zone I, where if you recall the psychology of the "accumulator" described in article #7, the price finds support at an S/R level. When you have finally accumulated your desired level of inventory, you start promoting snuff boxes as a collectible thereby creating demand in the general public. You sell your inventory at retail and - deciding that the demand for snuff boxes will continue to be strong for some time - you replenish your inventory by buying at wholesale as the ever-present traders who have jumped on the snuff-box bandwagon take their profits. This all takes place in zone II, which we may call the "trading zone", where the fixed inventory is turned over by changing hands within a group of trend following traders (of which you are the leader by virtue of your preeminent position). Finally, you observe that the number of snuff boxes coming up for sale is diminishing because they are moving into weak hands who are putting them away in vaults for the long term. This decreased liquidity in the market means that you will not be able to make as much as a trader since the turnover will be diminishing. You therefore decide to liquidate your remaining inventory and go on to something else. In this "distribution phase" (zone III), you support the market as required by buying on pullbacks in order that the price shall continue upward to attract the remaining johnny-come-latelys to buy the last of your inventory at the top of the market. Thereafter, you no longer have any interest in supporting the price and it drops of its own weight as few buyers are now found to maintain an orderly market.

This"accumulation-trading-distribution" sequence involving a fixed number of shares or contracts can arise in a number of different ways. One is a direct analog of the above scenario where - through skillful hype - stocks are cynically promoted to unrealistic valuations and foisted upon an unsuspecting public. On a more refined - though no less cynical - level, corporate insiders wishing to sell a large block of their stock engage an investment banker to optimally distribute this block, who then through "road shows" and the like beats the drum for the institutional buyers always looking for a new "concept" . Other scenarios can no doubt be conceived (eg. short squeezes), wherein a specific number of shares are involved in a dynamic process significantly different from the normal ebb and flow of supply and demand, and where the normal dynamics are restored when such shares have been absorbed. Why the specific parabolic formula for the effective displacement should work so well remains an interesting question in search of a viable model. (Analogs to the "two-fluid" models of low temperature physics come immediately to mind).

The actual computation of P-Hat from the above equation requires some discussion which will be given in the article to follow. There, we will also give examples of stocks which are presently following topfinder curves, so that testable predictions of future tops can be made.

15

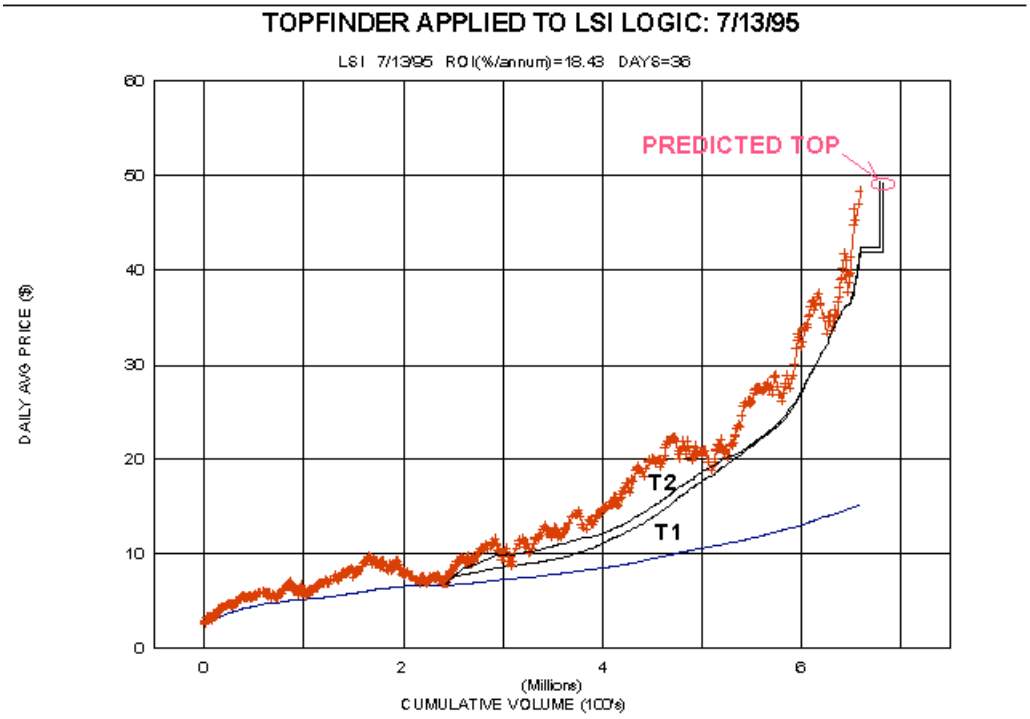
The TOPFINDER algorithm given in the previous article has been seen to be useful in "predicting" tops in historical price data. As the saying goes: "Prophecy is extremely difficult, especially as regards the future!". So in the present article we will apply TOPFINDER to a few stocks which have not yet reached their peaks. The future price action in these issues will thereby provide demonstrations of either the power or the limitations of the method.

First, however, a few words are required regarding the mechanics of applying the TOPFINDER algorithm. First one must pick a launch point, i, which identifies the day on which TOPFINDER is to start. Also the duration, D, must be chosen, where D is the cumulative volume from the launch point to the top. D is actually determined by iteratively adjusting it to provide a best "fit" to the price pullbacks subsequent to launch. To start this process, one must set D equal to some initial guess; I usually choose fifty days worth of volume, i.e. the cumulative volume at launch minus the cumulative volume fifty trading days earlier. In the fitting process used to determine D, generally an "eyeball" affair, give more weight to fitting the more recent pullbacks.

The actual computation of the TOPFINDER curve involves interpolation since we compute the difference between the current value of cum(p*v) and the corresponding value e units of cumulative volume earlier where e = d*(1 - d/D). "d" is the cumulative volume at the day for which the TOPFINDER curve is being computed minus the cumulative volume at lauch. e, therefore, will generally fall in the middle of some trading day so one has to interpolate linearly between the average price at the close of that day and the average price at the close of the preceding day.

In other words, cum(p*v) is only available from the data at a set of discrete cumulative volumes corresponding to the end of each trading day. Yet we are treating cum(p*v) as a continuous function of cumulative volume in order to determine it at values of cum(v) which do not generally correspond to one of these discrete points, and for this purpose we interpolate between the discrete values of cumulative volume bracketing e. Computationally, this will generally require a macro in a spreadsheet implementation of Midas, or some simple interpolation procedure if a high level language is used. Here I'll have to leave you to your own devices since to help you set up such calculations would carry us beyond the scope of these articles.

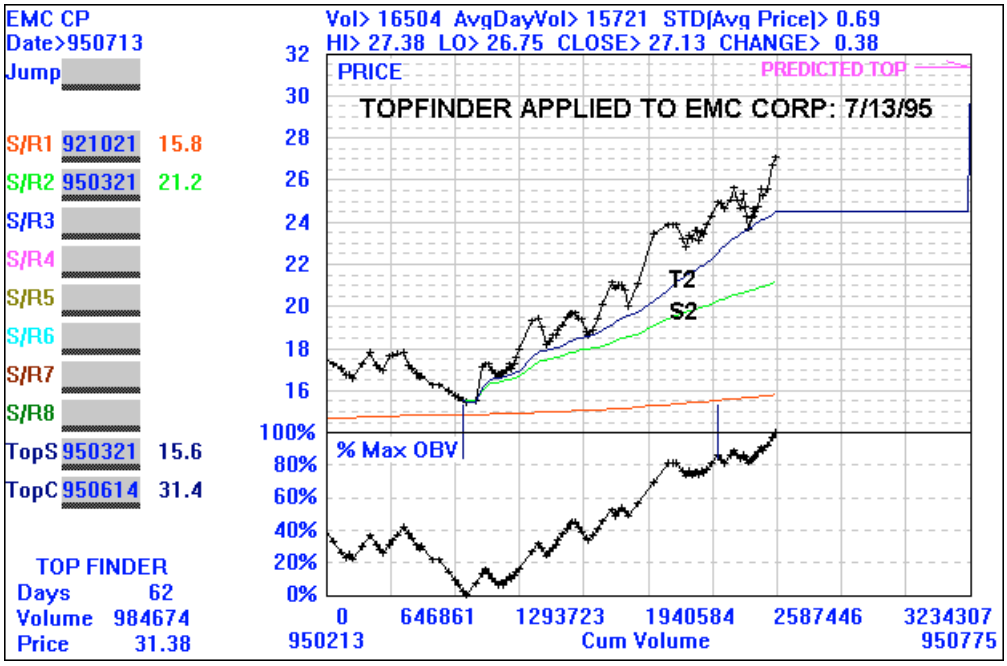
Turning now to prophecy, the first figure shows TOPFINDER applied to LSI Logic as of the day of writing this article. (obv has been omitted from the Midas chart so we can show more details of the price data). Shown are the primary support S1 (unlabelled for simplicity), and two TOPFINDER curves, labelled T1 and T2. T1 is launched at cum volume=0, and thus is the topfinder counterpart of S1. T2, on the other hand is launched at the point (cumvol around 2.5 million) where the price takes off from the primary and where we ordinarily would therefore start S2. (Again to keep the graphics simple, I have omitted S2).



Each TOPFINDER curve terminates in a backward "L" representing the extrapolation of the curve to the predicted top. The horizontal line shows how much cumulative volume is left until the top, while the vertical line terminates in a price projection determined by a simple linear extrapolation of the tangent to the topfinder curve at the endpoint of the data set. Recalling that TOPFINDER actually predicts the cumulative volume at which the price should top out, rather than the price itself, it should be borne in mind that the predicted topping price is only an extrapolated estimate, whereas the cum vol is the firm prediction.

I have included two topfinder curves in order to explore the sensitivity of the predicted top to choice of launch point. In each case, I did an independent eyeball fit to the pullbacks subsequent to launch. Thus, T2 tries to fit the minor pullbacks around cumvol=3.5 million, whereas T1 tries to fit the main pullback points starting at cumvol=3 million. It is quite remarkable that a single value of D can do so well in each case, and it is gratifying that the two agree so closely in their predictions of the top. (By dividing the predicted cumulative volume left to go by the average daily volume during the past fifty days, we arrive at an estimate of 36 trading days to the top).

While the LSI Midas graph was generated by a Lotus 123 spreadsheet macro, the second figure - for EMC Corp - was produced by a Windows application called WINMIDAS. This software, written by my colleague Dr. Stokes Fishburne, performs the topfinder and S/R computations "on the fly" in C++, so that one is able to move the launch points and adjust D by simply clicking and dragging the mouse - with the S and T curves instantly adjusting to these changes!



We have seen EMC before in article #5, which was written just after the launch of S2 in the current figure (labelled S3 in the earlier article). The failure of the price to pullback to S2 was the clue to try TOPFINDER and it is seen that T2 fits all the pullbacks quite well. As indicated in the lower left hand corner of the figure, the cumulative volume left to go is predicted to be 984, 674 round lots or 98,467,400 shares - about 62 trading days worth at the current level of activity. The extrapolated price at the top is 31 3/8. If EMC follows this script, then we would expect a pullback to S2 which, at that point would be in the 22-23 range.

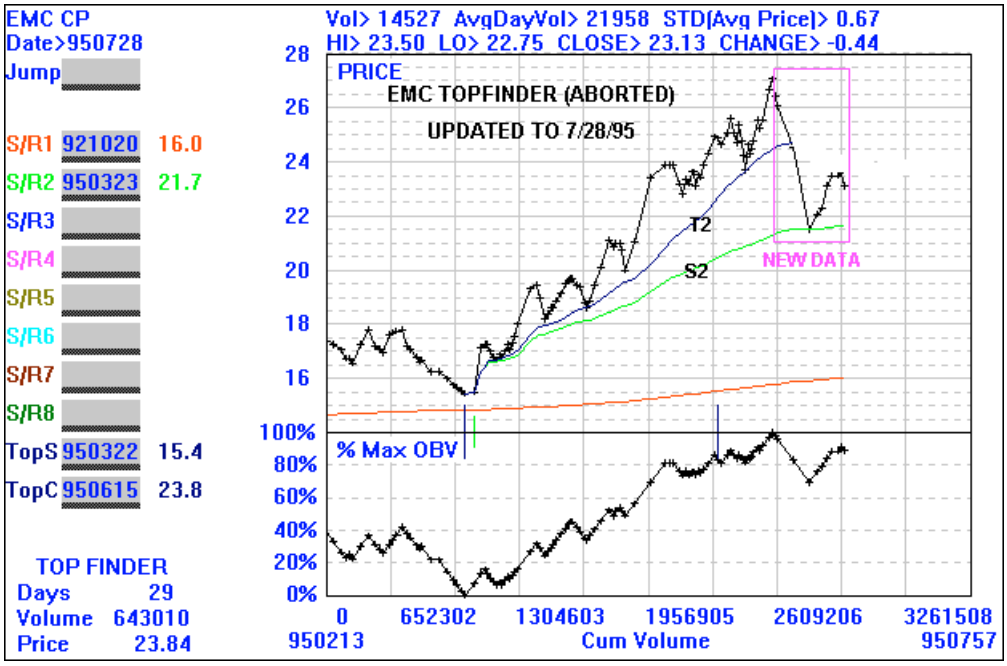
Having thus ventured into the future on a few individual stocks, in the article to follow we see what happens when we apply TOPFINDER to broad market indices like the S&P 500 and the Dow 30 - a topic of particular interest since the predicted tops are imminent!

POSTSCRIPT:

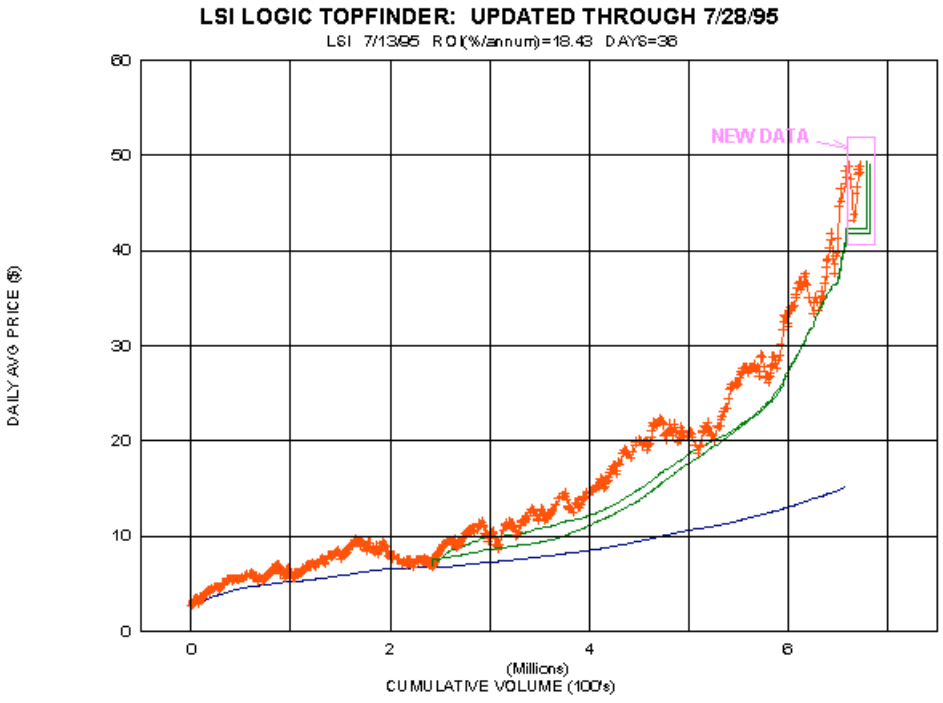
The above article was written on July 13, 1995; it is now July 29th. The intervening 16 days have included the sharp (130 Dow points) selloff of July 19th in which the "tech" stocks were particularly hard hit.It is interesting to see how TOPFINDER fared in the face of this selloff for our examples (LSI and EMC - both tech stocks).

There are, in general, three possible outcomes of a market sell-off on TOPFINDER. Usually, the effect is to shift the top further into the future, readjusting as it were the constant D to accommodate a pullback deeper than had been anticipated. (One may use the analogy of a minor earthquake which has the effect of releasing some of the pent-up stresses thereby buying some additional time before the "big one" hits).

Alternatively, the trauma may be sufficiently severe to abort the "launch" entirely - in the rocket metaphor of article #12. This is what happened with EMC. As seen in the third figure, the price pulled back exactly to "earth" (S2) as anticipated.



Or, TOPFINDER can take the selloff in stride. This may be what is happening with LSI. As seen in the fourth figure, the current price is quite close to the predicted top although some volume remains before burnout. To be sure, the pullback did penetrate the TOPFINDER curve somewhat (as would have been evident if we had updated it) and some readjustment of D may have been in order. For the present, the jury is still out but a verdict will be forthcoming shortly. In either event, it is quite often the case - as it is here - that TOPFINDER provides remarkably accurate price projections even if the top should turn out to occur later than anticipated.



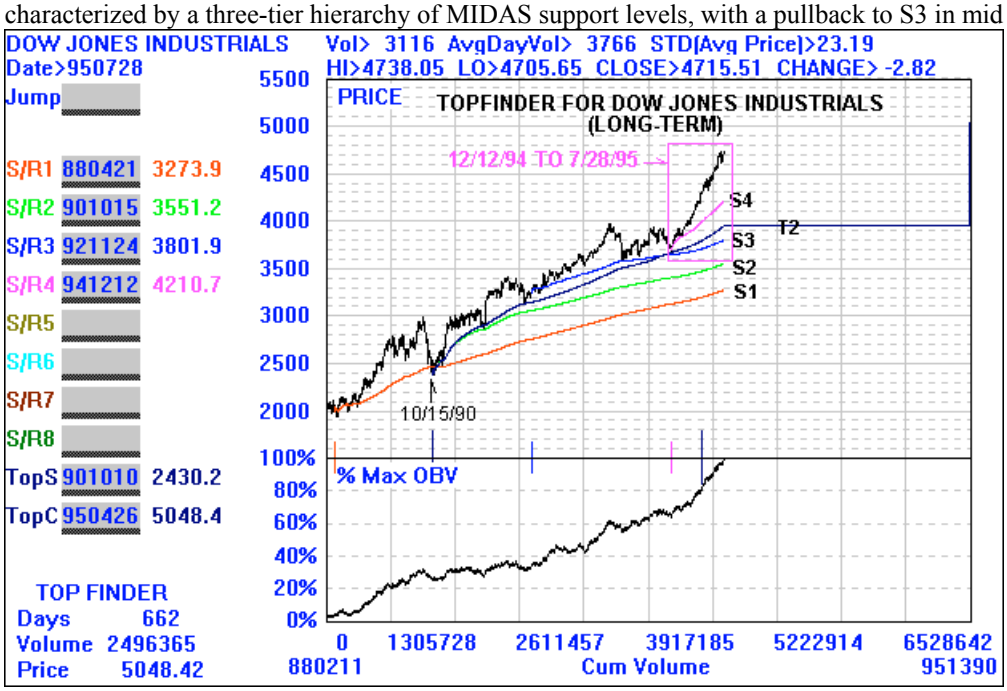
We have thus far applied the MIDAS method of technical analysis to individual stocks, although we speculated at the outset that its applicability extended to markets in general. To the extent that all markets are driven by the same basic psychological factors, this is perhaps not too unreasonable an idea. In the few remaining articles of this series, we will therefore look at some new types of market data from the MIDAS perspective. We begin here with stock market indices.

Market indices are simply the weighted averages of the prices in a subset of the universe of stocks. The "Dow" (Dow Jones Industrial Average) uses thirty high capitalization companies at the core of the American economy. The S&P-500 is based on a broad cross section of medium to high capitalization companies spanning the whole range of economic activities. The NASDAQ Composite Index has as its focus newer and more

dynamically changing enterprises. Each index thus represents a different facet of the economy, or - more properly - the consensus view or paradigm of the near to intermediate term (6 months to a year) prospects thereof.

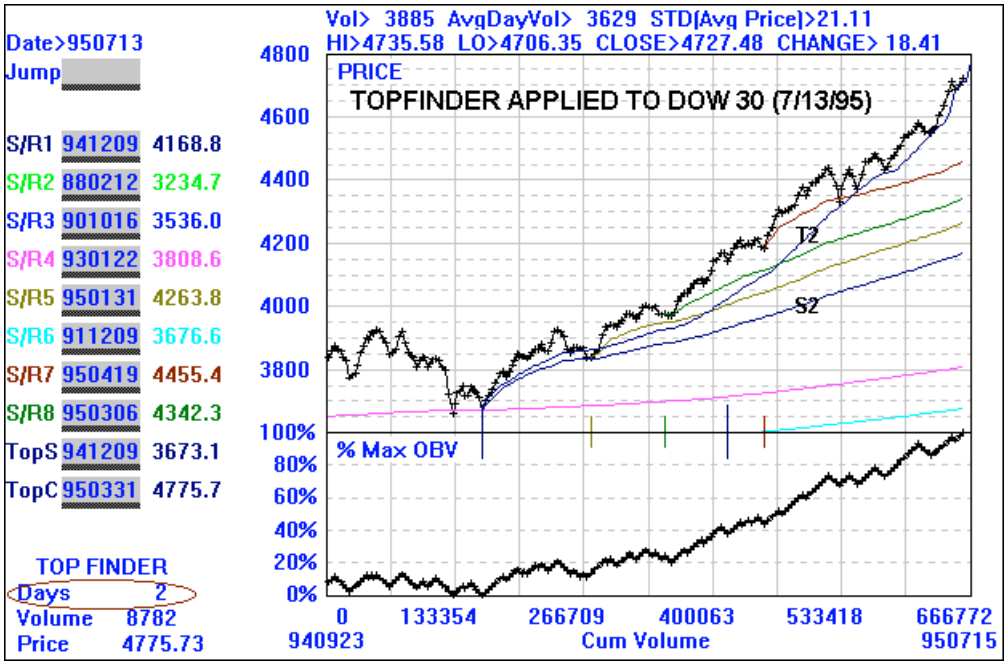
Recalling our earlier analogy (cork floating on the ocean) that individual stocks are strongly coupled to the market "tides", then one would expect that the zig zags in market indices should parallel those seen in individual issues. In filtering out the individual idiosyncrasies of single stocks or stock groups, the indices preserve the most basic aspects of the herd psychology, or as it's more delicately phrased, the "mood of the market". Since MIDAS tries to quantify this psychology, there is hope that it will have some applicability.

Without further preamble, then, in the first figure we apply the full MIDAS armamentarium to the Dow from 1988 to the present. (We shall henceforth display only charts generated by the WINMIDAS software, since - captioning aside - the entire chart can be produced from scratch in well under five minutes!) If we restrict attention to the seven year period prior to December 1994, it is seen the Dow was reasonably well characterized by a three-tier hierarchy of MIDAS support levels, with a pullback to S3 in mid December 1994.

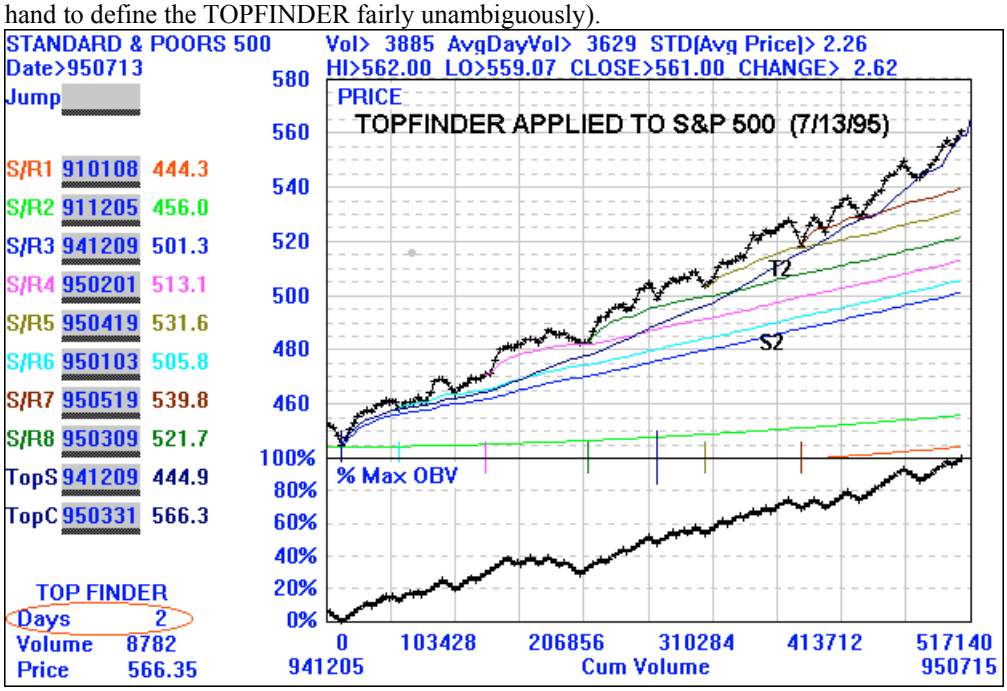


Furthermore, a TOPFINDER (T2) launched on 10/15/90 did a good job of accommodating the three main trend reversal points in that time period. The fact that this TOPFINDER has about 662 trading days (about 2 1/2 calendar years) of "fuel" left leads one to be generally sanguine about the long term trend of the market and - by implication - of the economy over this future span of time.

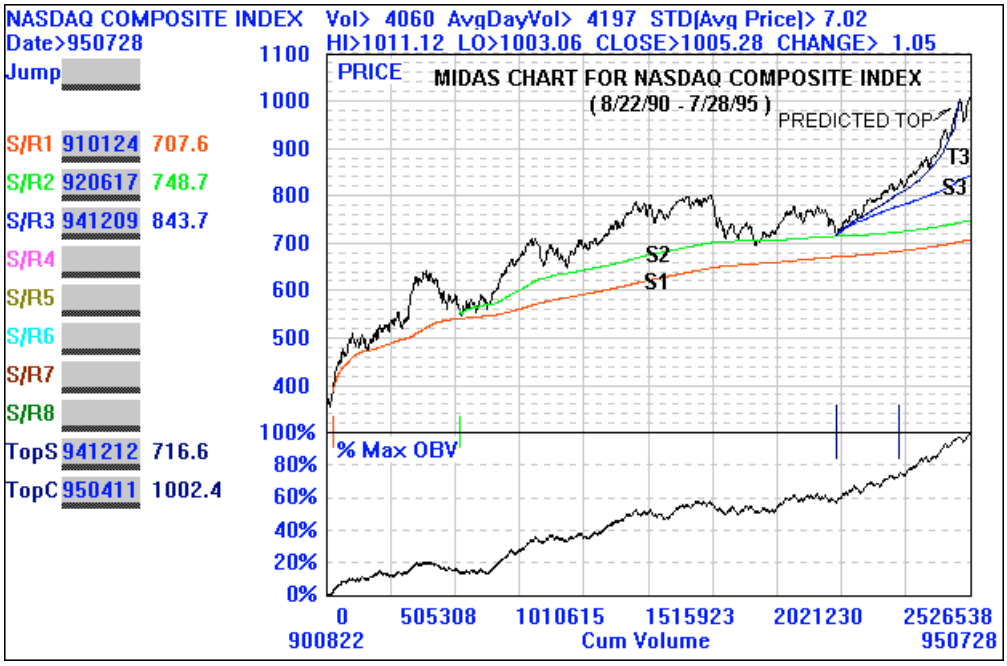
Since December of 1994, the market has taken off on an uncharacteristically monotonic rise which has every technician asking "where will it end?". Accordingly, in the second chart we apply TOPFINDER to this rise in the Dow. (To appropriately dovetail with the first chart, the labels here should read S4 and T4). The chart was generated on 7/13/95 and at that time we circled ("ellipsed" would be more appropriate) the fact that TOPFINDER gave the market only two more trading days until a predicted top of 4775 on July 17th.



Ominously, when a corresponding MIDAS chart for the S&P 500 was generated at the same time (see the third figure), TOPFINDER predicted a top in this index as well two days hence. As we shall see presently, ditto for the NASDAQ. So we have the quite remarkable circumstance that the same algorithm applied to three distinctly different market indices was predicting a top at the same time! (It must be freely admitted, however, that prior to July 13th the ambiguities inherent in fitting a two-parameter curve to rapidly rising price data did lead to premature expectations of the top; however by July 13th a sufficient number of zig zags were in hand to define the TOPFINDER fairly unambiguously).



So what happened? On July 17th the Dow reached an intraday high of about 4770, and then proceeded to sell off sharply in the next two days reaching an intraday low of about 4530 on Wednesday the 19th. 240 Dow points top to bottom in two days! A triumph for TOPFINDER? Maybe, maybe not. For as seen in the fourth figure which is a MIDAS chart for the NASDAQ Composite Index, generated after the close on July 28th, the sharp drop subsequently reversed itself and we are now back to where we were on July 17th (in fact slightly higher).

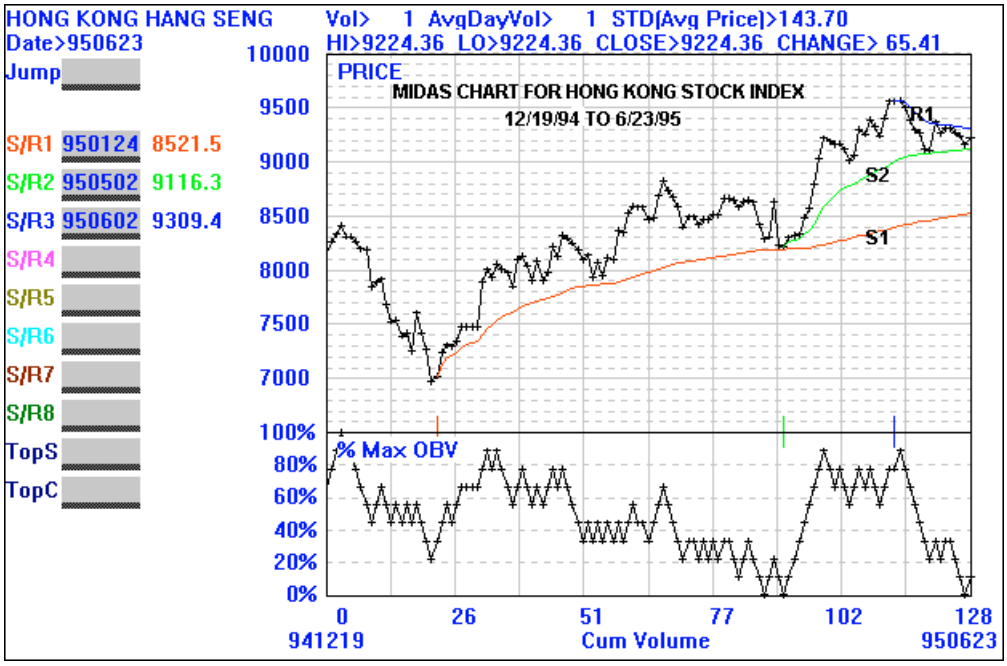


The ultimate verdict on TOPFINDER's utility in timing the market is therefore still with the jury. If the market henceforth extends its gains over a time span of more than a few weeks (which we could view as a reasonable margin of error in top prediction) then the only conclusion that can be reached is that TOPFINDER by itself (i.e. without the use of supplementary indicators) is not a reliable timing tool for market indices. My suspicion is, however, that TOPFINDER does have some truth in it. Perhaps it catches the top of the left shoulder in a head and shoulders top, or the first top in a double or triple top formation. Or maybe in this case at least MIDAS has come up with "fool's gold"! Time will tell.

TOPFINDER aside, the MIDAS S/R hierarchy does in fact appear to be useful in characterizing trend reversal points in market indices, as was seen in the first figure. At the very least, it provides downside targets (i.e. expected points of at least temporary support) in any selloff which might materialize. If the market should appear to be bouncing from such a theoretically predicted level one would take such a bounce seriously. Thus MIDAS can be viewed as an otherwise unavailable filter for deciding whether a given bounce is tradable or of the "dead cat" variety.
In the next article we will look at commodities and foreign markets.

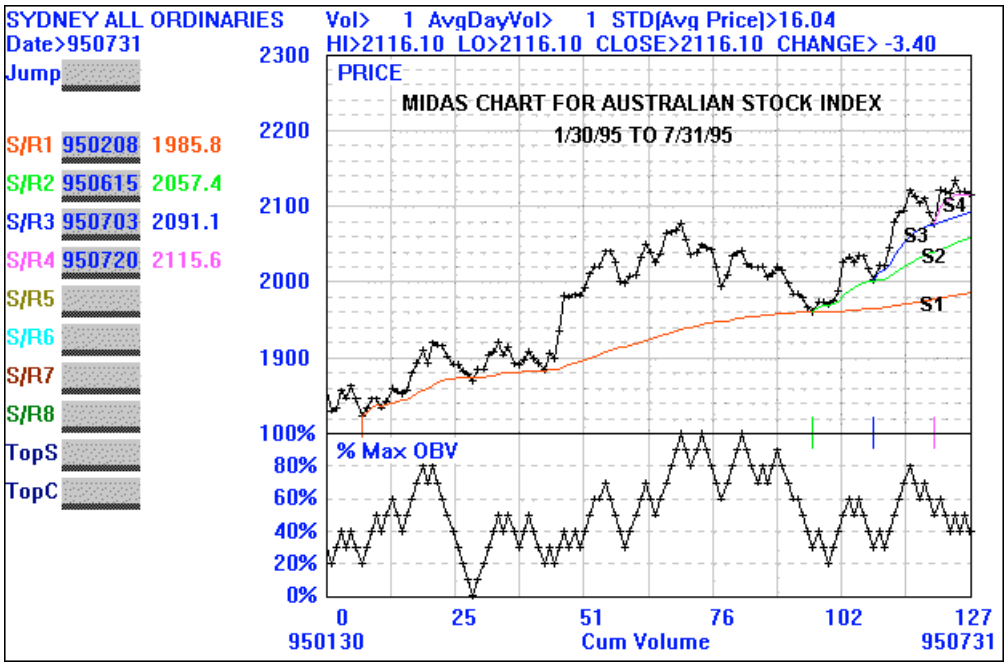
17

The previous article has demonstrated the applicability of the MIDAS techniques to stock indices based on the US market. While some questions remain concerning the reliability of TOPFINDER in such cases, it appears that the S/R hierarchy has value in the characterization of these indices. An interesting question, to which we turn in the present article, is whether indices based on other markets are similarly amenable to MIDAS methods.
There is a lively contemporary interest in overseas stock markets, a trend that can only accelerate in the years to come. If MIDAS can be applied to such markets, the universe of potential trading opportunities will at least double so this is an important question for the MIDAS trader. Accordingly, in the first figure we examine the Hong Kong Hang Seng Index for the time period from 12/19/94 through 6/23/95.



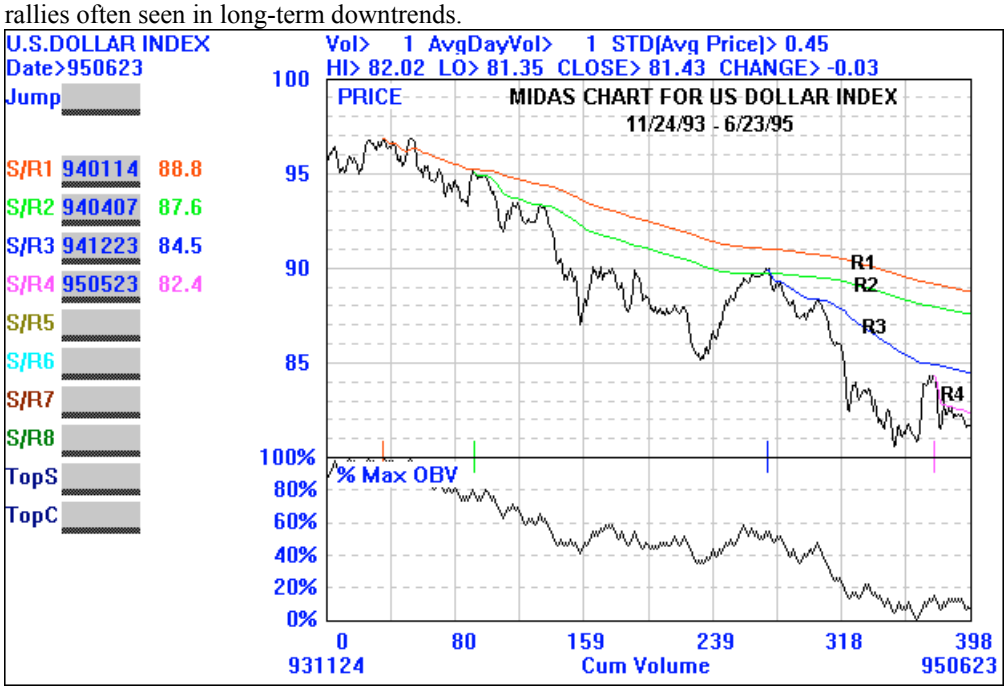
It is immediately evident that the S/R hierarchy is alive and well in the Crown Colony! A "text book case" if there ever was one: well validated (i.e. non-porous) primary and secondary support levels launched precisely from the trend reversal points, and a classic "squeeze" between the secondary support and the primary resistance levels. OBV is seen to be of little value, however, since volume data was not available and thus OBV counts only up days minus down days, rather than money flows in and out. The precision of the S/R levels is all the more remarkable since they were constructed in the absence of volume data, viz. by assigning equal volume to each day. (In the days subsequent to June 23rd, the squeeze was resolved to the upside with penetration of R1 and new highs for the index, followed by a retreat back to and bounce from S2).

Even more impressive is the application of MIDAS to the Sydney All Ordinaries Index of Australian stocks shown in the second figure. Here, again notwithstanding the lack of volume data, a four-fold hierarchy of support levels - each launched precisely from a trend reversal point - exactly fits the zig zags in the index. (Again OBV is of no apparent value). Since there are many ways to "play" the Australian market, from single country mutual funds to the ADR's of Aussie companies, this may prove to be a lucrative arena for MIDAS traders.

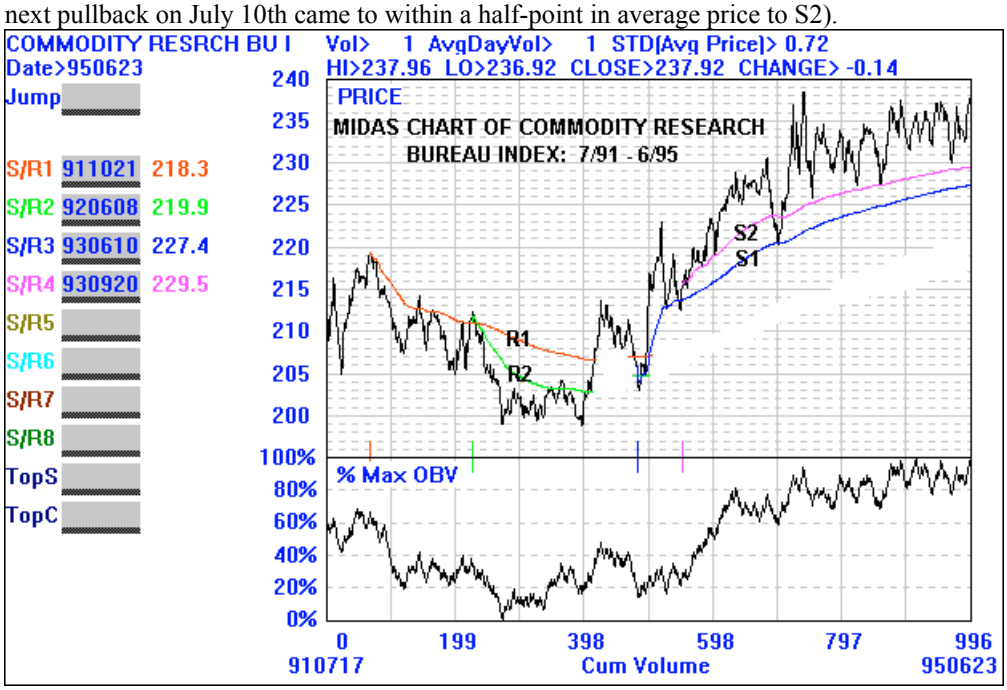


In terms of sheer dollar volume, the foreign exchange markets dwarf the equities markets and it is

therefore understandable that the forex trading desks are the Cape Canaveral of the "rocket scientists". Does MIDAS have anything to contribute to this arena? The third figure is a longer term chart of the US Dollar Index from 11/24/93 to 6/23/95. While not as perfectly clean as the first two examples, the four-fold hierarchy of resistance levels would clearly have proven of value in predicting trend reversal points. Furthermore, OBV being meaningful in this case, there is no question - from the MIDAS standpoint - of the intrinsically weak long-term technical position of the dollar. From a shorter-term currency trading standpoint, the position of the resistance levels (updated, of course, to the present time) would provide price objectives for the quick snap-back type rallies often seen in long-term downtrends.



Finally, in the fourth figure we turn to commodities - specifically the Commodity Research Bureau Index which is a weighted average of the dollar price of a basket of diverse commodities. As such, it reflects both currency swings as well as the averaged effects of cyclical and commodity-specific supply/demand imbalances. It is therefore no surprise that the data is noisier than we have heretofore seen. Nevertheless, there is no question in the mind of the MIDAS theorist that a trend change has occurred (R1 penetrated, OBV at new highs), nor is there any uncertainty as to where to expect a bounce in the next decline (S2). (In point of fact, the next pullback on July 10th came to within a half-point in average price to S2).



The whole commodities arena (indices, spot and futures) is terra incognita as far as MIDAS applications are concerned. My very preliminary research indicates that MIDAS techniques can provide trading advantages only on relatively short time scales (a few weeks) and only on some commodities at some times. In other words,

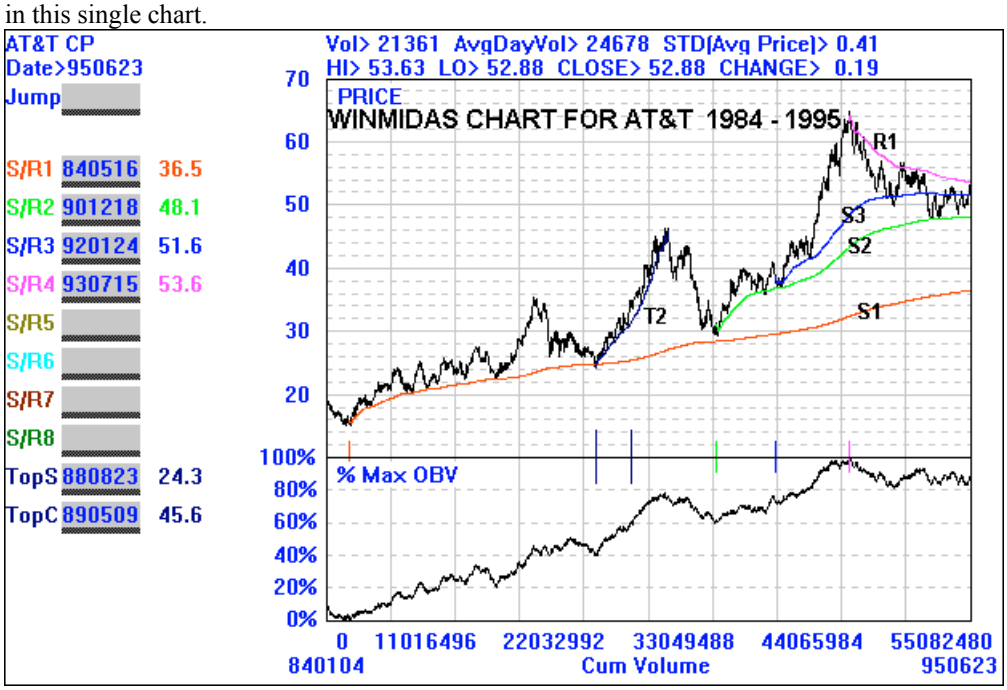
when it works it works and carpe diem is the dictum.

Having thus exhausted both my Latin and the findings of several decades of MIDAS research, we have clearly reached a natural boundary in this Introductory exposition. In the final article of the series, we will provide a dramatic recapitulation of the MIDAS method, and some valedictory remarks.

18

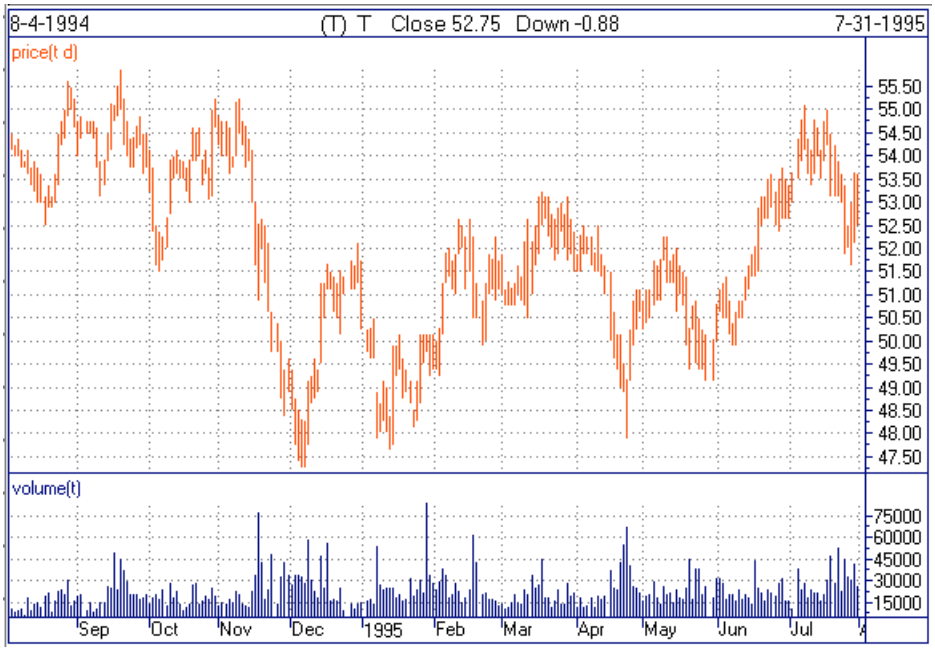
The goal of technical analysis is to discern underlying patterns of orderliness in the apparent random walk of prices and to use such perceived structures as the basis for projections into the future of past price behavior. The ever-present danger in this endeavor is one of self-delusion: seeing patterns where none really exist and - worse yet - trying to use such patterns to predict the unpredictable.

It was therefore particularly gratifying that the search for a final example on which to base our concluding remarks uncovered the long-term MIDAS chart for AT&T shown in the figure. Representing eleven years of data, virtually every feature of the MIDAS method detailed in the foregoing articles is exemplified in this single chart.



First, one can only marvel that the primary support level, S1, nearly precisely coincided with seven points of trend reversal over the six-year period 1984 - 1990. Similarly, the secondary support level, S2, launched in December 1990 has precisely accommodated at least a half- dozen trend reversals with negligible porosity. The primary resistance level, R1, is similarly validated and - together with S2 - has the price trapped in a classic "squeeze" pattern. The tertiary support S3 has functioned as a resistance level after having been penetrated. Early in the chart, the foothill behavior is quite evident and even TOPFINDER makes its appearance in the near-doubling move from the mid-twenties to the mid-forties! Finally, the fractal character of the S/R hierarchy is clearly demonstrated since this eleven year MIDAS chart is indistinguishable in its morphology from the many year-long charts we have seen in the various articles.

So it seems clear that MIDAS is for real and has much to contribute to technical analysis; self-delusion does not seem to be a problem. Consider the richness of detail and the ease of interpretation which MIDAS provides. A single glance at the chart shows immediately that AT&T is involved in a silent combat between S2 and R1. Failure of S2, i.e. resolution of the squeeze to the downside, means a retreat to S1 at about 37 (and a great buying opportunity at the first sign of a bounce there). A convincing penetration of R1, on the other hand, implies at least a retest of the previous high. By way of comparison, some one looking at the conventional price-volume bar chart for the past year shown in the second figure would probably conclude that here is another example of random walk behavior!



Thus, just as we began this series of articles with a side by side comparison of a MIDAS chart and a conventional bar chart, so shall we conclude this informal monograph. Those who would integrate these techniques into their trading discipline are advised to be ever mindful of the fact that the market is in the final analysis inherently unpredictable. All MIDAS does is to define more clearly the tracks along which the market has been moving and - absent shocks and paradigm shifts - will presumably continue to move. As powerful as the MIDAS techniques appear to be, they will frequently be humbled by the market's caprice. Just as King Midas found to his grief, power always has its limitations, often from the least expected quarter.

Finally, this is a good opportunity to address two of the most frequently asked questions in the correspondence provoked by these articles. First, "Does MIdas work for every stock?" Midas works best when a stock is in a coherent trend. Some stocks at some times are not and are better described in terms of a random walk. As an informal estimate based on years of experience, I would guess that at any given time, a useful S/R hierarchy can be identified for about two out of three stocks. TOPFINDER examples are generally rare, perhaps of the order of one instance in a year's worth of data for twenty stocks.

It has also often been asked "Why are you disclosing these techniques for free; why not try and sell them in some form or other?" I have always felt that if MIDAS has any practical value, ample rewards would come from the market itself (and they have) far in excess of anything that could be made from such commercialization of the method. So long as MIDAS is not sufficiently widespread that it becomes self defeating as everyone is recognizing the same trading opportunities, there is no reason not to share the insights with the technical analysis community. It is my hope that the articles will stimulate research along these new lines and that the same spirit of openness will prevail in sharing the results.